Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Ag 84 Mm
#552

Marketing Research Report 552
July 1962

Why Egg Handling Costs Vary

In Selected Cooperatives

by Harry E. Ratcliffe

Farmer Cooperative Service
U. S. Department of Agriculture

FARMER COOPERATIVE SERVICE
U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

Joseph G. Knapp, Administrator

The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, merchandising, product quality, costs, efficiency, financing, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

This study was conducted under authority of the Agricultural Marketing Act of 1946 (RMA, Title II).

Contents

	Page
Highlights	iii
Purpose and scope of study	1
Organizations selected	2
Period covered	4
Operations included	4
Data collected	5
Factors affecting unit direct costs	7
Wage rates and other labor costs	7
Man-hour output	12
Unit direct costs by operations	14
Collecting eggs	16
Receiving eggs	22
Candling and cartoning eggs	26
Coopering cases	38
Stacking eggs	44
Loading out eggs	50
Delivering eggs	53
Factors affecting indirect costs	58
Hourly salary costs	58
Volume received	62
Type of association	63
Application of findings	63
Volume of eggs handled	64
Installation of laborsaving equipment	64
More efficient use of labor	65
Better plant arrangement	65
Egg quality improvement	65
Integrated services	65
Appendix	66

Highlights

Producers and consumers both have a stake in reducing handling costs as eggs move from farm to market. Producers have a special interest in what their cooperatives can do to lower such costs as this may mean higher returns to them. Likewise consumers can benefit when lower handling costs are passed on to them.

We conducted a study to: (1) Obtain comparative costs and labor requirements of the several functions or operations in handling eggs, (2) determine and measure causes of variations in costs and labor output among associations, and (3) find and apply means of increasing efficiency in individual operations and organizations.

This report, the fifth in a series on the study, deals with the causes of variation in costs and labor output among egg handling plants.

We chose 23 cooperatives in the North Central, Northeastern, and Western States for study and analysis of costs. One personal visit of 2-week duration was made to each cooperative.

Total costs comprised two general types: (1) Direct and (2) indirect or overhead.

Direct costs pertained to direct labor, packing and processing materials, truck operating and contract hauling, and such other direct costs as service fees for inspection and grading and for royalties on machines.

Indirect or overhead costs were those costs that could not be readily separated nor easily traced directly to an individual operation, and were fixed. Indirect costs were divided into two general categories: (1) Indirect labor and (2) indirect costs for other than individual labor.

To facilitate comparison, we broke costs down into 14 operations or steps. These were: (1) Collecting eggs from producers, (2) receiving eggs into the plant, (3) inspecting wholesale grades, (4) sizing, (5) candling, (6) cartoning, (7) packing cartoned eggs, (8) coopering cases, (9) stacking and holding, (10) loading out, (11) delivering, (12) shell treating, (13) shell cleaning, and (14) egg breaking. Not all cooperatives included in the study performed all 14 operations.

Direct costs constituted an average of 83 percent of the total; indirect costs, 17 percent.

Unit direct costs varied among associations mainly because of: (1) Differences in wage rates and other labor costs, (2) differences in unit output per man-hour, and (3) differences in cost of materials and equipment for the candling and cartoning operation.

The cost of labor varied among associations because of the differences in the wage rates for regular and overtime labor, variations

in the amount of overtime, and variations in additional labor costs such as old age benefits, retirement benefits, unemployment insurance, hospitalization, and bonuses.

On the average, 79 percent of total direct labor cost was regular labor, 10 percent overtime, and 11 percent additional labor or fringe benefit costs. These percentages varied considerably among associations and among plant operations.

Total direct hourly labor costs varied among associations from a low average of $1.06 in the North Central area to a high average of $2.60 for an association in the Western area. Hourly labor costs varied by operations because of: (1) amount of overtime, (2) different wage rates for different types of work, and (3) differences in fringe benefits.

Regular labor averaged 92 percent of total direct labor and overtime labor, 8 percent for 23 associations. In the North Central area, overtime hours were only 4.1 percent of total hours.

Labor efficiency as measured by output a man-hour varied widely among associations--for eggs collected, from 5.1 to 63.9 cases; for eggs candled and cartoned, from 2.2 to 5.5 cases; and for stacking eggs in holding rooms, from nearly 54 to nearly 326 cases a man-hour.

Differences in direct hourly labor costs and labor output a man-hour largely explained the variation in direct labor costs a case among associations for all operations.

Total indirect costs included plant and non-plant costs.

Plant costs were: Salaries; heat, power, and water; general insurance; real estate and personal property taxes; maintenance and repair; plant supplies (general); depreciation (buildings and plant equipment); and miscellaneous.

Non-plant costs were: Salaries; office supplies, stationery, and printing; postage; telephone and telegraph; advertising; bad debts; interest; bank service; auditing and legal; travel; automobile; directors' expense; annual meeting expense; educational expense; dues and subscriptions; contributions and donations; depreciation (furniture and fixtures and automobile); and miscellaneous.

For 23 associations the average indirect plant costs were 15.8 cents a case of eggs received, or 39.7 percent of total indirect costs. Indirect non-plant costs were 23.1 cents a case, or 60.3 percent of the total. Associations varied widely in unit indirect costs. Differences in indirect salaries and wages accounted for much of these variations.

Indirect salaries made up more than half the total indirect costs on the average--21.3 cents a case, or nearly 56 percent of total indirect costs. Indirect plant salaries averaged 14.6 cents a case or 39.1 percent of total indirect costs. Indirect non-plant salaries averaged 14.6 cents a case or 39.1 percent of total indirect costs.

Associations in the North Central area had the lowest average indirect costs--31 cents a case, compared with 40.8 cents for the Northeast associations and 48.3 cents for the Western associations. The North Central associations were mostly dairy or other multi-purpose type.

The findings of this report indicate that egg handling costs can be reduced by: (a) Increasing the volume of eggs handled (although bigger volume alone may not necessarily reduce all the various handling costs), (2) installing labor saving equipment if this is practical, (3) more efficient use of labor, (4) better arrangement of equipment in the plant, (5) fostering egg quality improvement programs among producers, and (6) integrating services.

Why Egg Handling Costs Vary

In Selected Cooperatives

by Harry E. Ratcliffe

Poultry Branch
Marketing Division

The cost of eggs to the consumer may be divided into three distinct parts: (1) Cost of production, (2) cost of handling, including collecting from producers and delivering to the market place; and (3), cost of handling in the market place, including retail store cost.

The cost of handling, while the smallest of the three, is an important one. Egg handlers to be competitive must keep their costs at a minimum. Handling costs also are of importance to producers and consumers. Low handling costs by cooperatives usually mean higher returns to producers or lower costs to consumers, or both.

Purpose and Scope of Study

The general purpose of an overall study of egg handling costs and labor efficiency was to obtain handling costs and determine yardsticks that would enable handlers to know whether their costs were out of line and, if so, what factors might be responsible.

The study had three major objectives: (1) To obtain information on costs and labor requirements of the several operations or steps in handling eggs and then determine averages, ranges, and yardsticks, (2) to determine and measure factors affecting costs and labor output; and (3) to find and apply methods, skills, techniques, and other means of increasing efficiency in individual operations and organizations.

Four reports[1] have been published covering the first objective. This

[1]Ratcliffe, Harry E. Cost of Marketing Eggs and Labor Output of Selected Cooperatives. Part I--Northeast. Gen. Rpt. 59. Farmer Cooperative Service, U.S. Dept. of Agr. May 1959.

Ratcliffe, Harry E. Cost of Marketing Eggs and Labor Output of Selected Cooperatives. Part II--North Central. Gen. Rpt. 72. Farmer Cooperative Service, U.S. Dept. of Agr. May 1960.

Ratcliffe, Harry E. Cost of Handling Eggs and Labor Output of Selected Cooperatives. Part III--Western. Gen. Rpt. 75. Farmer Cooperative Service, U.S. Dept. of Agr. July 1960.

Ratcliffe, Harry E. Cost of Handling Eggs and Labor Output of Selected Cooperatives. Combined Report of Northeast, North Central, and Western Areas. Gen. Rpt. 88. Farmer Cooperative Service, U.S. Dept. of Agr. Jan. 1961.

Northeast:	*Number*	Western:	*Number*	North Central:	*Number*
Ohio	3	California	2	Kansas	2
Connecticut	1	Utah	2	Minnesota	2
New Jersey	1	Oregon	1	South Dakota	2
New York	1	Washington	1	Iowa	1
Pennsylvania	1	Total	6	Michigan	1
Virginia	1			Wisconsin	1
Total	8			Total	9

report covers the second objective--to find and measure factors affecting costs and labor output.

The third objective will not be covered in a publication but the Farmer Cooperative Service uses the findings of the study in its work with egg marketing cooperatives.

While we obtained data only from cooperative handlers, the analysis of factors affecting costs could be useful to all egg handlers.

Organizations Selected

Cooperatives included in the study were selected because they were: (1) Doing an effective job of marketing eggs, (2) either candling or cartoning a large portion of eggs received, (3) handling relatively large volumes compared with other associations in their areas, and (4) using special types of equipment.

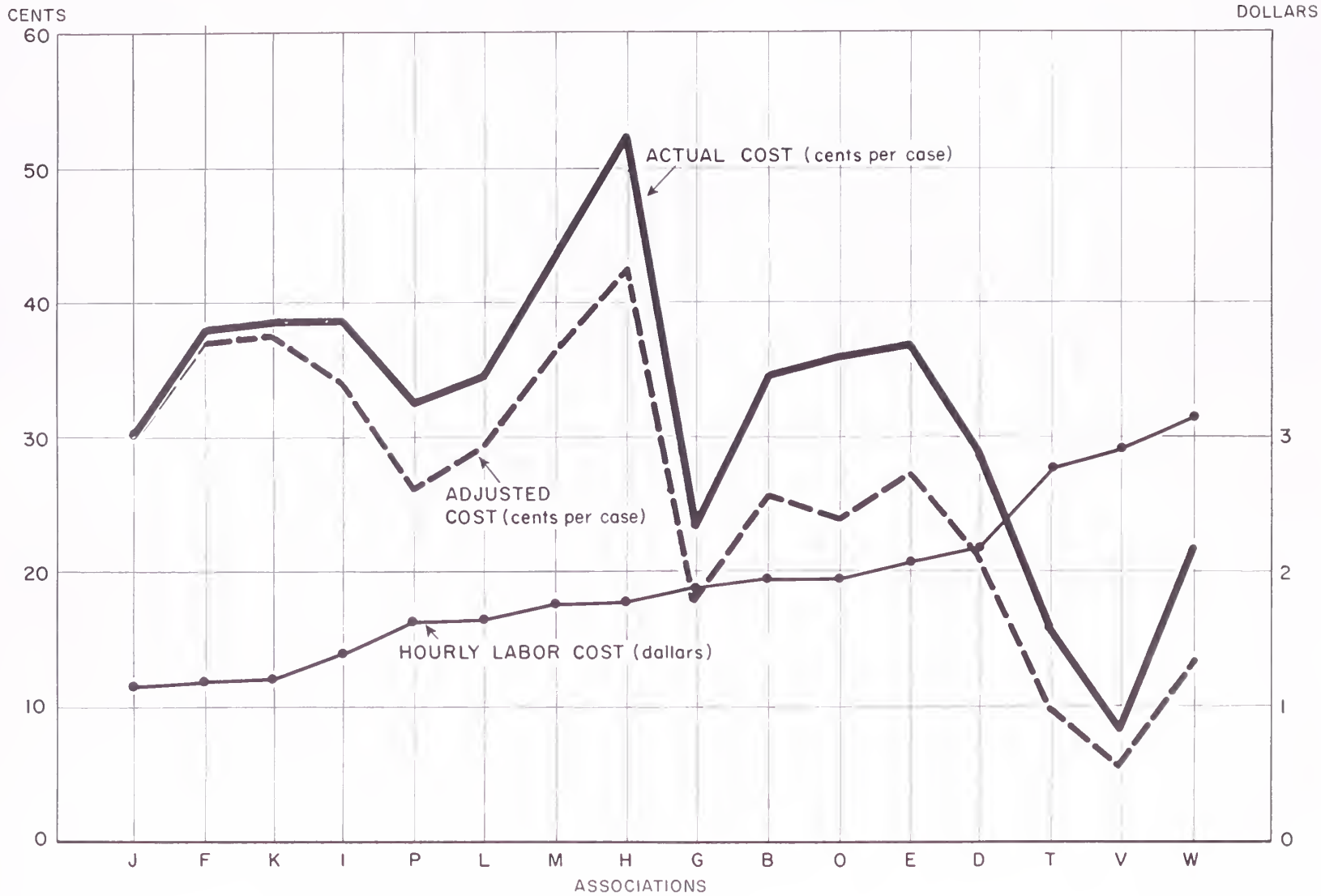
The 23 associations were located in 16 States in 3 areas as shown in the accompanying tabulation.

One association each in California and Ohio and those in Oregon, Utah, Washington, and Wisconsin operated more than one egg handling plant. Data were obtained separately from two plants of the Utah association, but from only one plant each of the other five operating more than one plant. Thus 22 associations and 23 plants were included in the selection.

All of the associations handled eggs, of course, but only at 11 of the plants did eggs or eggs and poultry constitute the major portion of the business done in terms of value. In the accompanying tabulation and in figure 1 the plants are classified according to the commodity group in which a major portion of the business was done at the time the study was made. Four of the farm supply associations were organized as egg or egg and poultry marketing associations. Later feed and other farm supplies were added and in one instance, marketing other farm products. The dollar volume of these services became greater than that of eggs and poultry. However, at one association, the dollar volume was about equally divided between eggs and poultry and the other services.

	Number
Dairy	6
Farm supplies	6
Eggs	6
Eggs and poultry	5
Total	23

Figure I. Collecting eggs: Hourly labor cost and comparison of total actual and adjusted[1] direct cost per case, 16 associations, 2-week period.



[1] Labor cost adjusted to lowest hourly direct labor cost.

Each association has been given a code letter in this report, as the information and data were obtained on a confidential basis with the understanding that information by organizations would not be divulged.

The total annual volume of eggs received by the 23 plants[2] was nearly 4.1 million 30-dozen cases, with a plant average of 177,356 cases and a range from a low of 31,000 to a high of 555,000 cases a year. The 2-week volume received averaged 6,821 cases a plant and ranged from a low of 1,192 to a high of 21,346 cases.

Period Covered

We made an intensive study of the egg handling operations of each cooperative for a period of 2 consecutive weeks. Because of the time and personnel required, it was not possible to visit all associations during comparable periods in their seasonal volume cycle. Consequently, the volume handled by the cooperative plants during the period visited was below the average for the year for some cooperatives and above for others, and therefore may not be strictly representative of a typical week. However, the time of the visit did not materially affect the comparability of unit direct costs of operations among associations.

Operations Included

Operating costs in total were not comparable among associations because all handlers did not perform the same service or perform them in the same proportion. Therefore, it was necessary to break down costs and labor output by individual operations, steps, or services through the handling or marketing process so that they could be made as nearly comparable as possible among cooperatives.

In this study, handling eggs through the cooperatives was broken down into 14 separate operations. These were: Collecting, receiving, sizing, inspecting, candling, cartoning, packing cartoned eggs, coopering cases, stacking eggs in holding room, loading out, delivering, shell treating, shell cleaning, and egg breaking.

Table 1 shows the number of associations that performed each operation. Only six operations--receiving, sizing, candling, coopering cases,

TABLE 1.--Number of associations performing egg handling operations, 2-week period

Operation	Number of associations
Collecting	21
Receiving	23
Inspecting	4
Sizing	23
Candling	23
Cartoning	20
Packing cartoned eggs	20
Coopering	23
Stacking	23
Loading out	23
Delivering	21
Shell treating	5
Shell cleaning	8
Egg breaking	4

[2] Data obtained are for single egg plants. In the case of multiple plant associations, the figures shown do not represent the whole operation. Unless otherwise noted, the term "association" or "associations" in the remainder of the report refers to a single plant or total of the single association plants covered.

stacking, and loading out--were performed by all associations. Two operations, inspecting and egg breaking, were performed by only four associations. Only 2 associations performed more than 11 operations and no association performed all 14 operations. Two associations performed less than 10 operations.

In order to make labor costs and outputs as comparable as possible among the cooperatives studied, it was necessary to determine precisely where each operation began and ended. In the case of labor, this was done by including the pertinent labor elements covered in each operation, as listed on page 66 of the appendix.

Data Collected

During the 2-week period of the study of each association, information collected concerned: (1) Direct costs and labor requirements, (2) indirect costs, and (3) related information. Total direct costs averaged 83 percent of total costs.

Direct Costs and Labor Requirements

Data collected under "direct costs" pertained to direct labor, packing and processing materials, truck operating and contract hauling, and other direct costs.

As used in this report, direct labor costs and direct labor requirements were those incurred for a single operation or for part of an operation. They, therefore, could be separated and could be charged directly to that operation or to one or more of its elements. Direct labor costs varied in total amount as the volume of eggs increased or decreased, but the effect on unit direct costs was much less than on unit indirect costs.

Labor requirements or man-hour outputs were determined by dividing the number of cases handled in the operation over a period of time by the total number of hours required to perform an operation during the same period. These output data are important because they usually reflect labor efficiency more accurately than dollar-and-cents costs, are more comparable, and do not become outdated as soon.

Costs for direct labor, in addition to wages and salaries for regular and overtime work, included fringe benefit costs such as Federal old age benefits, unemployment insurance, workmen's compensation, bonuses, pensions, and hospital insurance. After the labor cost for each employee was determined, his time and wages were charged to the operation in which he worked. When he worked on several operations his labor was distributed among them on a time basis.

Costs for materials were determined according to three types of egg packs used. These were: (1) 30-dozen loose or case pack, (2) 30-dozen or equivalent cartoned pack, and (3) liquid egg pack.

The most important materials were case shells, flats and fillers or filler-flats, case labels, gummed tape, cartons, carton seals, oil for shell treating, washing materials, and cans and lids for liquid eggs.

Cost data for operating association trucks and charges for contract trucking were obtained.

Other direct costs incurred were service fees for Federal or State

inspection and grading and royalties on machines for setting up and closing cartons and grading and packaging eggs. Indirect costs constituted 17 percent of total costs among the plants studied.

Indirect or Overhead Costs

Indirect costs referred to those costs incurred for more than one operation or for parts of more than one operation. They, therefore, could not be readily separated and were difficult to trace directly to an individual operation or its elements. Most indirect costs were fixed costs and changed little in total amount when the volume of product changed. But, on a unit basis, they decreased when the volume increased and increased when volume decreased.

Indirect costs were divided into labor[3] and other[3] costs.

Indirect Labor Costs.--Indirect labor costs--salaries or wages of the manager, office help, salesmen, fieldmen, janitors, night watchmen, repair and maintenance employees, and plant foremen--were determined for the specific 2-week period under study. As such, they represented costs for the same period as for the direct labor. When the work of some employees was chargeable to both direct and indirect costs, their labor costs were divided accordingly.

Other Indirect Costs.--Indirect expenses, other than indirect labor costs, were obtained from the audit report for the latest fiscal year of each association. These annual data were then calculated on a period basis, and the period average applied to current operations. In other words, indirect cost figures, excluding indirect labor, were also for a 2-week period and therefore 1/26 of such costs of the fiscal year preceding the period of study.

This method was used because indirect cost information was not currently available on a short-time basis for the period of study. Also, annual indirect costs, especially in total, varied little from year to year for any individual association. Therefore, a 2-week apportionment of the previous year's indirect costs was considered sufficiently accurate, complete, and reliable for this analysis.

Indirect costs on a unit basis were calculated by dividing the average period indirect costs by the 2-week average number of cases of eggs received during the 12 months ending with the close of the period of study (volume for the previous 12 months divided by 26). This study did not apportion these costs to individual operations as it did direct costs. For this reason a comparison of these unit indirect costs among associations may not be as meaningful as a comparison of direct costs apportioned by operations.

When marketing associations handled farm supplies or other farm products as well as eggs, it was necessary to allocate the proper portion of each indirect expense item to the egg department. The records of most associations provided such allocations to the egg department. But even in such cases, modifications were sometimes found necessary in order to handle indirect individual expense allocations uniformly for all associations.

[3] See appendix--for description of indirect labor and other indirect costs.

Other Information

Facts other than cost data obtained during the period of study helped explain costs, factors affecting costs, and labor efficiency. For the most part, this information included labor rates for regular and overtime work, amount of overtime, quality of eggs candled and cartoned, grading standards used, number and type of jobs performed by candlers, percentage of eggs sized on farms before reaching the plant, types of equipment used, plant and equipment layout, flow of eggs through the plant, length of farm routes, and frequency of farm pickups.

Factors Affecting Unit Direct Costs

Variations of direct egg handling costs among associations were largely due to differences in: (1) Cost of labor, including fringe benefits, (2) unit labor output a man-hour; and (3) cost of materials in the candling and cartoning operation.

The efficiency of handling eggs may be measured in two ways: (1) The unit cost of the labor and (2) number of cases handled a man-hour. The second method is actually a measure of the efficiency of labor in performing work and can be translated into dollars-and-cents costs by applying wage data. Labor costs were due not only to efficiency of labor but to wage rates, fringe benefits, and overtime hours. An association with efficient labor that must pay high wage rates and high fringe benefits may be no more efficient cost-wise than one with less efficient labor and lower wage rates and fringe benefits. For this reason, unit labor cost was an important measure of efficiency.

Wage Rates and Other Labor Costs

Among the most important causes for variations in the unit labor cost of handling eggs among plants were the differences in basic wage rates, amount of overtime, and fringe benefits. Table 2 shows that the composition of the total direct labor costs among the 23 associations varied considerably. Total regular labor costs varied from a low of 63.3 percent of total labor costs to a high of 95.6 percent and averaged 79.2 percent for 23 associations. Overtime labor cost varied from zero to 28.3 percent of total direct labor costs. Other or fringe benefit labor costs among associations varied from a low of 3.8 to a high of 20.6 percent of total direct labor costs.

By areas, regular labor costs averaged 74.3 percent of total labor in the Northeast, 87.7 in the North Central area, and 73 percent or lowest in the Western area. The percentage of overtime and fringe benefit labor costs were lowest in the North Central area--4.5 and 7.8 percent, respectively. The associations in this area were smaller and not located as close to industrial areas where wage rates and fringe benefits were higher. The eight Northeast associations averaged highest, 14.5 percent, in overtime labor costs while the six Western plants averaged highest, 14.8

TABLE 2.--Composition of total direct plant labor costs, 23 associations, 2-week period

Area and association	Regular	Overtime	Other [1]	Total
		Percent		
Northeast:				
A	63.6	28.3	8.1	100
B	76.7	12.8	10.5	100
C	69.2	18.9	11.9	100
D	78.4	8.2	13.4	100
E	83.6	2.9	13.5	100
F	71.4	21.8	6.8	100
G	80.5	2.6	16.9	100
H	70.9	20.2	8.9	100
North Central:				
I	74.7	16.6	8.7	100
J	92.5	0.0	7.5	100
K	84.4	9.7	5.9	100
L	90.5	0.0	9.5	100
M	90.8	2.1	7.1	100
N	82.6	8.1	9.3	100
O	95.6	.6	3.8	100
P	85.9	3.7	10.4	100
Q	92.2	0.0	7.8	100
Western:				
R	79.6	8.4	12.0	100
S	81.6	5.0	13.4	100
T	69.7	15.4	14.9	100
U	63.3	23.1	13.6	100
V	70.2	15.7	14.1	100
W	73.6	5.8	20.6	100
Averages: [2]				
All associations	79.2	10.0	10.8	100
Northeast	74.3	14.5	11.2	100
North Central	87.7	4.5	7.8	100
Western	73.0	12.2	14.8	100
Range:				
Low	63.3	0.0	3.8	--
High	95.6	28.3	20.6	--

[1] Fringe benefits.
[2] Unweighted.

percent, in other or fringe benefit labor costs.

Variations in other labor costs among the associations studied were caused largely by legal requirements being different from State to State and the policy of the associations toward voluntary retirement, insurance benefits, paid holidays, and bonuses.

The composition of total direct labor costs among regular, overtime, and other labor costs was not the same for all operations within a plant and varied widely from one association to another. The

composition of average direct labor costs of the 23 associations is shown in table 3.

On the average, overtime labor costs were a smaller percentage of total labor costs for most of the in-plant operations than for the out-of-plant ones--collecting eggs at farms and delivering to buyers. Candling and cartoning overtime labor costs were, for example, only 8.7 and 9.2 percent, respectively, of the total, compared with 14.2 and 12.5 percent, respectively, for collecting and delivering. Overtime labor cost percentages ranged from a low average of 3.1 percent of total labor costs for sizing to a high of 19.6 percent for shell treating.

TABLE 3.--Composition of direct labor costs by operation, 23 associations, 2-week period

Operation	Type of direct labor costs									
	Regular			Overtime			Other			Total of averages
	Range [1]		Average [2]	Range [1]		Average	Range [1]		Average [2]	
	Low	High		Low	High		Low	High		
	Percent									
Collecting	61.4	99.1	71.6	0.1	44.8	14.2	6.2	51.8	14.2	100
Receiving	55.2	99.1	74.2	.5	33.9	14.1	0.9	40.4	11.7	100
Inspecting	61.4	95.8	73.3	9.6	29.7	17.2	4.2	15.3	9.5	100
Sizing	77.0	92.0	86.4	.2	9.5	3.1	8.0	13.5	10.5	100
Candling (loose to case)	56.1	94.1	80.3	2.5	30.6	8.7	7.3	23.6	11.0	100
Cartoning	59.0	93.9	79.7	1.3	33.9	9.2	5.8	23.1	11.1	100
Packing cartoned eggs	60.7	94.7	78.7	1.3	34.3	10.7	5.0	16.1	10.6	100
Coopering	62.8	94.8	77.9	2.2	23.3	11.9	6.0	17.4	10.2	100
Stacking and holding	59.8	92.5	74.5	2.8	29.0	15.3	5.4	22.4	10.2	100
Loading out	60.4	92.5	76.6	3.2	29.9	12.6	4.3	19.5	10.8	100
Delivering	60.2	94.1	72.0	.7	44.9	12.5	5.9	41.4	15.5	100
Shell treating	56.5	93.9	69.7	.0	33.9	19.6	6.1	14.2	10.7	100
Shell cleaning	67.7	94.0	80.9	.0	26.9	10.9	5.4	14.9	8.2	100
Egg breaking	60.2	92.1	81.9	.0	26.5	6.7	7.2	16.2	11.4	100
Range:										
Low	55.2	92.0	69.7	.0	9.5	3.1	.9	13.5	8.2	--
High	77.0	99.1	86.4	9.6	44.9	19.6	8.0	51.8	15.5	--

[1] Low and high associations.
[2] Average of all associations performing the operation.

Other or fringe benefit labor costs averaged from a low of 8.2 percent for the shell cleaning operation to a high of 15.5 percent for delivering. These fringe benefit percentages were more than twice as great as those in an earlier cost study, reflecting increased fringe benefits to most employees and the inclusion in the study of more associations in States where such benefit payments were relatively high.

Table 4 indicates the composition of the total hours of direct labor as between regular and overtime work. Regular hours ranged from a low 76.1 percent of total hours to a high of 100 percent and averaged 91.7 percent. This average is 5.7 percent more

TABLE 4.--Composition of total direct labor hours, 23 associations, 2-week period

Area and association	Regular	Overtime	Total
Northeast:		*Percent*	
A	76.1	23.9	100
B	88.8	11.2	100
C	85.0	15.0	100
D	93.9	6.1	100
E	97.6	2.4	100
F	83.0	17.0	100
G	98.2	1.8	100
H	84.3	15.7	100
North Central:			
I	86.8	13.2	100
J	100.0	.0	100
K	92.9	7.1	100
L	99.9	.1	100
M	98.6	1.4	100
N	88.5	11.5	100
O	99.6	.4	100
P	97.0	3.0	100
Q	100.0	.0	100
Western:			
R	93.0	7.0	100
S	96.2	3.8	100
T	87.0	13.0	100
U	79.7	20.3	100
V	86.9	13.1	100
W	95.5	4.5	100
Averages:			
All associations	91.7	8.3	100
Northeast	88.4	11.6	100
North Central	95.9	4.1	100
Western	89.7	10.3	100
Range:			
Low	76.1	.0	--
High	100.0	23.9	--

than for the associations included in similar studies published in 1952.[4] Overtime hours ranged from zero for each of two associations to a high of 23.9 percent of total direct labor and averaged 8.3 percent for the 23 associations. This compares with the average of 14.0 percent for 25 associations in the earlier study.

This decrease in the use of overtime labor was due to some extent to the use of more than one labor shift a day when volume justified it rather than working one-shift laborers overtime. However, only two of six associations using multi-shifts eliminated or nearly eliminated all overtime. Multi-shift labor crews not only decreased unit labor costs but made possible more efficient use of buildings and to some extent of egg handling equipment.

Two associations in each area were using multi-labor crews. Associations in the Northeast area had the most overtime labor, 11.6 percent of total labor; the North Central area the least, 4.1 percent. One association in the North Central area using a multi-shift crew had no overtime labor--the other had only 0.4 percent overtime. One single crew plant also had no overtime labor and another only 0.1 percent overtime. The average overtime for single crew plants was 5.2 percent of total labor. The accompanying tabulation shows average overtime labor in percentage of total labor for plants using multi- and single-labor crews.

Area	Multi-crews	Single crews
	Percent	
All associations	6.2	9.2
Northeast	9.6	12.6
North Central	.2	5.2
Western	8.8	11.0

Total direct hourly labor costs varied widely among associations from a low of $1.06 an hour for association J to a high of $2.60 an hour for association W and averaged $1.66 for 23 associations (table 5). These variations came from differences in hourly wage rates, overtime pay, and fringe benefits including bonuses and incentive payments. Total hourly labor costs were a composite of all the operations performed in handling eggs.

Table 5 shows the hourly labor costs averaged highest among the associations in the Western States where both wage rates and fringe benefits were higher than for associations in other areas. Hourly labor costs averaged lowest in the North Central area.

Average hourly labor costs by operations also varied--among plants as well as among operations within a plant. Some of the extent of variations of average hourly labor costs among operations is indicated in table 6. Hourly cost variations among operations averaged lowest, 7 cents, for association F, and the highest, $1.52, for association D.

[4] Bradford, Henry W., Ratcliffe, Harry E., and Scanlan, John J. Costs and Labor Efficiency of Specialized Egg Marketing Cooperatives in the Northeast. Farm Credit Admin., U.S. Dept. of Agr. Misc. Rpt. 158. Feb. 1952.

Ratcliffe, Harry E., Bradford, Henry W., and Scanlan, John J. Cost of Handling Eggs by Selected Cooperatives in the North Central States. Farm Credit Admin., U.S. Dept. of Agr. Misc. Rpt. 162. May 1952.

These publications are out of print but copies are available for reference in most agricultural college and university libraries.

The accompanying tabulation groups the operations by the lowest and highest hourly labor costs.

Lowest cost		Highest cost	
Operation	Number of[1] times	Operation	Number of times
Packing cartoned eggs	8	Collecting	6
Coopering	7	Delivering	6
Cartoning	4	Stacking	3
Candling	3	Receiving	3
Sizing	2	Loading out	2
Shell treating	1	Inspecting	1
Receiving	1	Coopering	1
		Candling	1

[1] Adds to more than similar column under highest cost because two associations had two lowest cost operations.

Seven operations shared the lowest hourly labor costs and packing cartoned eggs was lowest eight times and coopering seven times. Eight operations shared the highest hourly costs--of which collecting and delivering was highest six times each.

Hourly labor costs varied by operations for several reasons: (1) Wages were usually higher for men than for women (candling, cartoning, and packing cartoned eggs were usually done by women); (2) length of employment by the association; (3) amount of overtime--such operations as collecting and delivering eggs required more overtime than other operations; and (4) different wages for different types of work.

In another section of this report, starting on page 14 direct hourly labor costs are discussed by operations and their effect on the variation of labor costs a case of eggs among associations is shown.

TABLE 5.--Average hourly cost of direct labor, 23 associations, 2-week period

Area and association	Labor cost per hour
Northeast	
A	$1.83
B	1.59
C	1.75
D	1.65
E	1.74
F	1.20
G	1.64
H	1.59
North Central	
I	1.26
J	1.06
K	1.11
L	1.07
M	1.31
N	1.21
O	1.11
P	1.33
Q	1.47
Western	
R	2.38
S	1.81
T	2.50
U	2.48
V	2.57
W	2.60
Averages:	
All associations	1.66
Northeast	1.62
North Central	1.21
Western	2.39
Range:	
Low	1.06
High	2.60

Man-Hour Output

A measure of efficiency of a plant or of an operation within a plant is the unit output over a period of time, such as the number of cases of eggs handled hourly by one person.

TABLE 6.--Average hourly direct labor costs: Lowest and highest cost operation and spread between lowest and highest cost, 23 associations, 2-week period

Association	Low		High		Spread
	Labor cost per hour	Operation	Labor cost per hour	Operation	
A	$1.60	Receiving	$1.98	Loading out	$0.38
B	1.20	Coopering	1.95	Delivering	.75
C	1.46	Coopering	2.38	Inspecting	.92
D	1.43	Candling	2.95	Coopering	1.52
E	1.19	Sizing	2.67	Delivering	1.48
F	1.18	Coopering	1.25	Stacking	.07
G	1.34	Candling and cartoning	2.74	Delivering	1.40
H	1.43	Sizing	1.93	Delivering	.50
I	1.17	Cartoning and packaging cartoned eggs	1.58	Receiving	.41
J	.82	Coopering	.31	Stacking	.49
K	1.07	Candling	1.20	Collecting	.13
L	.85	Packing cartoned eggs	1.63	Collecting	.78
M	1.18	Cartoning and packaging cartoned eggs	1.77	Collecting	.59
N	1.16	Packing cartoned eggs	1.60	Receiving	.44
O	.91	Coopering	1.94	Collecting	1.03
P	1.20	Cartoning	1.62	Collecting	.42
Q	1.22	Packing cartoned eggs	1.86	Receiving	.64
R	2.04	Coopering	2.44	Candling	.40
S	1.71	Coopering	2.06	Stacking	.35
T	2.33	Packing cartoned eggs	3.11	Delivering	.78
U	2.12	Shell treating	3.12	Loading out	1.00
V	2.15	Packing cartoned eggs	2.92	Delivering	.77
W	2.36	Packing cartoned eggs	3.12	Collecting	.76

Output a man-hour varied widely among associations for the various operations performed (table 7). For example, the highest delivering output of 87.3 cases a man-hour was 14.1 times the lowest of 6.2 cases. For candling eggs the highest output of 5.5 cases was only 3.7 times the lowest output of 1.5 cases.

Since some of the associations included in the study did not perform all operations or perform them to the same extent, it would be meaningless to compute an average total overall output figure for each association and compare them among associations. Furthermore, all operations performed by an association

TABLE 7.--Average and range in output per man-hour of labor by operations, specified number of associations

Operation	Number of associations	Output per man-hour		
		Range		Average
		Low	High	
			Cases	
Collecting	[1] 16	5.1	63.7	14.0
Receiving	23	27.7	198.1	78.4
Inspecting	4	14.8	60.1	32.5
Sizing	4	3.9	21.7	13.4
Candling	23	1.5	5.5	3.0
Cartoning	20	2.2	6.7	3.3
Packing cartoned eggs	20	8.9	40.0	19.3
Coopering	23	22.2	301.1	81.3
Stacking	23	33.9	325.9	111.5
Loading out	23	29.6	266.2	108.4
Delivering	[1] 10	6.2	87.3	27.5
Shell treating	3	11.5	16.5	13.8
Shell cleaning	6	5.3	16.1	10.7
Egg breaking	3	1.3	2.1	1.8

[1] Associations using own trucks and employees.

did not take the same volume of eggs. Because of this, the effect of output on variations in labor costs among associations and factors affecting labor output are also discussed in the following section on costs by individual operations.

Unit Direct Costs by Operations

In this section, variations in unit direct costs among plants by operations are analyzed. Indirect costs were not allocated by operations.

All associations performed such operations as receiving eggs into the plant, candling, stacking and holding eggs, coopering of cases, and loading eggs out of the plant.

Many of the associations performed other operations, such as collecting, cartoning, packing cartoned eggs, and delivering eggs to buyers, but only a few did inspecting of wholesale grades of eggs, shell processing, shell cleaning, and egg breaking.

The study showed than an association that had a low or high unit labor cost in any one operation did not necessarily have consistently low or high costs in all operations performed. This also applied to the output a man-hour of employees.

As shown in table 8, only a few associations were lowest or highest in more than one operation except that association V the highest output a man-hour in five operations and had the lowest in none; Q had the lowest labor cost in three operations; D and J each had the lowest labor cost in two operations and J the highest cost in another operation. Associations L and R each had

TABLE 8.--Associations with lowest and highest unit direct labor costs and labor output per man-hour by egg handling operations, 2-week period

Operation	Number of associations performing operation	Associations with lowest and highest direct labor costs per case		Associations with lowest and highest labor output per man-hour	
		Lowest	Highest	Lowest	Highest
Collecting	16	V	O	K	V
Receiving	23	E	R	R	V
Inspecting	4	A	B	B	A
Sizing	4	D	E	E	D
Candling	23	Q	U	K	R
Cartoning	20	Q	T	L	V
Packing cartoned eggs	20	F	H	M	V
Coopering	23	Q	K	K	Q
Stacking	23	O	J	I	W
Loading out	23	L	U	U	L
Delivering	10	V	T	T	V
Shell treating	3	J	U	U	J
Shell cleaning	6	J	S	K	I
Egg breaking	3	D	T	T	Q

the lowest labor output in one operation and each had the highest in another operation.

Table 8 also shows that for seven operations, associations with the lowest labor costs a case had the highest labor outputs a man-hour, and for eight operations, associations with the highest labor costs had the lowest labor outputs a man-hour.

Collecting Eggs

When the cost of truck operation is added to that of direct labor, the cost of collecting eggs from farms and ranches is one of the higher cost egg handling operations commonly performed.

Except as noted, only the cost of collecting eggs from producers in trucks owned by cooperatives is considered in this section.[5]

Direct Labor and Truck Operating Cost

Egg collecting costs were made up of two items--direct labor and truck costs. Direct labor consisted of (1) loading truck with empty cases, (2) driving truck, (3) loading truck at farms, (4) making out producer and route records, and (5) unloading at the receiving plant. Truck costs consisted of depreciation, gasoline and oil, lubrication, tire replacement, repairs, insurance, and licenses and taxes. Direct labor made up 59 percent and truck expense 41 percent of total collecting costs.

The three most important causes of variations in the unit cost of collecting eggs were: (1) Variations in hourly labor rates, (2) output a man-hour, and (3) volume of eggs collected. Density of producer members also affected unit costs.

Hourly Labor Costs

The effect of variations in hourly labor costs was determined by adjusting the actual labor cost of collecting a case of eggs to the lowest average hourly cost of $1.14 of one association. We adjusted the cost by: (1) Calculating the percentage each association's hourly labor cost was of the hourly labor cost of the association having the lowest such cost; (2) dividing the actual labor cost a case of each association by the percentage which its hourly labor cost was of the lowest hourly cost and multiplying by 100. The same procedure was used to adjust the hourly labor cost incurred in the other egg handling operations.

Table 9 shows the hourly collecting labor cost for 16 associations that used their own trucks in picking up eggs, actual and adjusted labor cost a case, truck expense a case, the total actual unit collecting costs and also the total cost with the unit labor costs adjusted for differences in hourly labor costs. The highest hourly labor cost was $3.12--that of association W. Had this cost been the same as that of the association with the lowest hourly labor cost, association J with $1.14, average labor cost a case of association W would have been 4.6 cents instead of the actual cost of 12.6 cents a case.

[5] Twenty-one of the 23 associations studied performed the collecting operation. Ten of these used association-owned trucks exclusively, 8 used a combination of owned trucks and contract haulers, and only 3 used contract haulers exclusively. Collecting cost of one association was not available. At one plant producers delivered all eggs handled.

TABLE 9.--Collecting eggs: Average hourly direct labor cost, actual and adjusted[1] average direct labor cost, truck expense, and total cost per case, 16 associations, 2-week period

Area and association	Hourly labor cost	Labor cost per case		Truck expense	Total cost per case	
		Actual	Adjusted		Actual	Adjusted[1]
			Cents			
Northeast:						
F	$1.19	20.5	19.9	17.1	37.9	37.0
H	1.78	27.3	17.5	24.8	52.1	42.3
G	1.89	13.5	8.1	9.7	23.2	17.8
B	1.93	22.3	13.2	12.3	34.6	25.2
E	2.09	20.1	11.0	16.4	36.5	27.4
D	2.16	15.4	8.1	13.0	30.8	21.1
North Central:						
J	1.14	20.2	20.2	9.8	30.0	30.0
K	1.20	23.4	22.2	15.3	38.7	37.5
I	1.40	23.1	18.8	15.2	38.3	34.0
P	1.62	22.7	16.0	9.9	32.6	25.9
L	1.63	18.1	12.7	16.4	34.5	29.1
M	1.77	19.9	12.8	23.7	43.6	36.5
O	1.94	28.5	16.7	7.2	35.7	23.9
Western:						
T	2.78	9.9	4.1	5.7	15.6	9.8
V	2.92	4.6	1.8	3.6	8.2	5.4
W	3.12	12.6	4.6	9.2	21.8	13.8
Averages:						
All associations	1.91	18.9	13.0	13.1	31.7	26.0
Northeast	1.84	19.9	13.0	15.6	35.9	28.5
North Central	1.53	22.3	17.1	13.9	36.2	31.0
Western	2.94	9.0	3.5	6.2	15.2	9.7
Range:						
Low	1.14	4.6	1.8	3.6	8.2	5.4
High	3.12	28.5	22.2	24.8	52.1	42.3

[1] Adjusted to lowest average hourly direct labor cost.

Figure 1 shows the hourly labor costs and the difference between the total actual and adjusted unit collecting costs. The adjusted costs ranged from 0.9 cent a case below the actual cost for association F to 11.8 cents below for association O and averaged 5.7 cents a case lower for 15 associations. These reductions in total adjusted costs were due entirely to the adjustments in labor costs.

Labor Output a Man-Hour

Table 10 shows the effect of collecting output a man-hour on the adjusted labor cost a case and truck expense a case. The adjusted labor cost decreased consistently among associations as output a man-hour increased--about 2 cents a case for each case increase in output when output increased from about 5 to 10 cases a man-hour; about one-half

TABLE 10.--Collecting eggs: Average output per man-hour and adjusted[1] average direct labor cost per case, 16 associations, 2-week period

Output group and association	Output per man-hour	Cost per case	
		Labor	Truck
Lowest:	*Cases*	*Cents*	
K	5.1	22.2	15.3
F	5.7	19.9	17.1
J	5.7	20.2	9.8
I	6.0	18.8	15.2
H	6.5	17.5	24.8
O	6.8	16.7	7.2
Middle:			
P	7.2	16.0	9.9
B	8.6	13.2	12.3
M	8.9	12.8	23.7
L	9.0	12.7	16.4
E	10.4	11.0	16.4
Highest:			
D	14.0	8.1	13.0
G	14.0	8.1	9.7
W	24.7	4.6	9.2
T	27.9	4.1	5.7
V	63.9	1.8	3.6
Averages:			
All associations	14.0	13.0	13.1
Lowest group	6.0	19.2	14.9
Middle group	8.8	13.1	15.7
Highest group	28.9	5.3	8.2
Range:			
Low	5.1	1.8	3.6
High	63.9	22.2	24.8

[1] Adjusted to lowest average hourly direct labor cost.

cent a case for each case increase in output from 10 to 20 cases a man-hour; and less than one-fourth cent a case from 20 to 30 cases a man-hour.

The relationship of collecting labor output to truck expense a case was not highly significant although the highest output group had truck costs which averaged 6.7 cents a case lower than the average for the lowest group and 7.5 cents lower than for the middle group.

Some explanation can be made for this lack of significance. The two associations in the lowest output group with the highest truck costs picked up a small number of cases of eggs a mile while the association in this group with the lowest truck expense picked up twice as many eggs a mile. An association in the

middle output group with the lowest truck expense picked up eggs and dairy products on the same trucks. In general, associations with a truck expense above the average for their labor output group picked up fewer eggs a mile than did those with a truck expense below the average for the group.

Volume Collected

Table 11 shows that total direct collecting costs a case, including both association and contract trucks, varied in relation to volume considerably among associations. Most associations collecting more than 5,000 cases during the 2-week period had some cost advantage over those with smaller volumes--on the average, 13.1 cents a case over the middle volume group and 16.5 cents over the group collecting less than 2,500 cases.

Some factors affecting collecting labor output a man-hour are now discussed.

TABLE 11.--Collecting eggs: Volume and average direct adjusted[1] cost per case, 16 associations, 2-week period

Volume group and association	Volume	Adjusted cost per case
Lowest group	*Cases*	*Cents*
F	297	37.0
J	1,011	30.0
L	1,030	29.1
O	1,073	23.9
H	2,407	42.3
Middle group		
I	2,921	34.0
G	3,038	17.8
E	3,277	27.4
K	3,284	37.5
D	4,160	21.1
M	4,879	36.5
Highest group		
P	5,234	25.9
W	6,471	13.8
B	11,633	25.2
T	21,083	9.8
V	24,455	5.4
Averages:		
All associations	6,016	26.0
Lowest group	1,164	32.5
Middle group	3,593	29.1
Highest group	13,775	16.0
Range:		
Low	297	5.4
High	24,455	42.3

[1] Includes labor and truck expense-labor cost per case adjusted to lowest average hourly direct labor cost.

Eggs Collected a Mile.--Data available from 12 associations made it possible to determine the number of cases of eggs collected for each mile of truck travel from the plant and return.

The effect on labor output of the number of cases of eggs collected for each mile traveled appears in table 12. As shown by the group averages in this table, the trend in output a man-hour was definitely upward as eggs collected a mile increased. On the average, labor output increased nearly 11 cases a man-hour for each case increase a mile.

Number of eggs collected a mile is determined by dividing the volume of cases collected by the number of miles traveled. The distance traveled to obtain a truck load of eggs is affected by the number of stops, the number of cases of eggs picked up at each stop, and the distance between stops. If pickups are relatively large and distances between stops relatively short, the number of cases collected a mile will be relatively large. When pickups are large and stops are far apart, cases a mile may be relatively small and cases a man-hour relatively low. Small pickups at each stop, even if the stops are close together, may

TABLE 12.--Collecting eggs: Average number of cases per mile and average output per man-hour and cases per stop, 12 associations, 2-week period

Volume per mile group and association	Volume per mile	Output per man-hour	Volume per stop
Less than 0.6 cases		*Cases*	
H	0.4	6.5	2.4
F	.5	5.7	1.8
I	.5	6.0	(1)
M	.5	8.9	2.0
0.6 - 0.9 cases			
J	.6	5.7	(1)
E	.6	10.4	3.1
D	.8	14.0	5.6
O	.9	6.8	2.3
B	.9	8.6	3.2
One case or more			
G	1.0	14.0	10.4
W	1.3	24.7	16.8
T	2.1	27.9	8.1
Averages:			
All associations	.8	11.6	5.6
Lowest group	.5	6.8	2.1
Middle group	.8	9.1	3.5
Highest group	1.5	22.2	11.8
Range:			
Low	.4	5.7	1.8
High	2.1	27.9	16.8

[1] Not obtained.

result in a small number of cases a mile as well as a small labor output an hour.

Some of the major variations in output a man-hour among associations in relation to collections a mile shown in table 12 can be explained partly by the conditions mentioned above. For example, although association T collected 69 percent more eggs a mile than association W, its output a man-hour was only 3.2 cases more than association W, or 13 percent. Association T collected less than half the number of cases a stop--8.1 compared with 16.8 by association W (table 12). Associations B and O each picked up 0.9 of a case of eggs a mile with relatively low outputs a man-hour. Both associations collected a relatively small number of cases a stop--3.2 and 2.3, respectively. On the other hand, association D, with close to the same collections a mile as B and O, had a higher labor output because of larger collections a stop than did associations B and O.

Road Conditions.--Another factor that can affect egg-collecting outputs is the condition of roads traversed by the egg trucks, but no information was obtained concerning road conditions during this study. Poor roads increase collecting time and truck operating costs.

Summary of Labor Cost and Output Ranges

Associations with the highest and lowest direct labor costs and labor output in collecting eggs in each of the three regions and causes thereof are shown in the accompanying tabulation.

Region	Cost or output level and association	Primary factor	Secondary factor
		Cost	
Northeast	Highest - H	Low labor output	Relatively high hourly labor cost
	Lowest - G	High labor output	--
North Central	Highest - O	Average labor output	High hourly labor cost
	Lowest - L	Relatively high output	Hourly labor cost near average
Western	Highest - W	High hourly labor rate	Lowest labor output in region
	Lowest - V	High labor output	--
		Output	
Northeast	Highest - D and G	High collections per mile	Cases per stop high
	Lowest - F	Low collections per mile	Cases per stop low
North Central	Highest - L	Cases per stop relatively high	--
	Lowest - J	Low collections per mile	Cases per stop low
Western	Highest - V	Highest collections per mile	Some eggs collected and delivered on same trip
	Lowest - W	Low collections per mile	--

Receiving Eggs

Receiving eggs into a plant was one of the minor and, therefore, lower cost operations of an egg handling plant. The cost included direct labor, depreciation on equipment, and this operation's share of indirect costs. Direct labor costs and causes of variations among associations are discussed below. Since very little equipment was required for this operation, no analysis was made of the depreciation cost.

Direct labor is the only important cost in receiving eggs. Among 21 plants,[6] the labor cost ranged from a low of 1.3 cents a case for association E to a high of 8.1 cents for association R.

The principal causes of labor cost variations among associations were: (1) Hourly labor costs, (2) output a man-hour, and (3) volume of eggs received.

Hourly Labor Costs

The effect of variations in hourly labor costs was determined by adjusting the actual labor cost of receiving a case of eggs to the lowest average hourly cost of $1.19 for three associations.

Table 13 shows the hourly labor cost, the actual and adjusted labor cost a case, and the difference between the actual and adjusted cost. Association W with the highest hourly receiving labor cost of $2.72 had an actual cost a case of 3.7 cents. This cost adjusted for the difference of $1.53 between the hourly labor cost of this association and that of the lowest hourly cost of $1.19 would have been 1.6 cents or 2.1 cents a case less. The adjusted labor costs ranged from the same for 3 associations to 3.8 cents a case below the actual cost for 1 association and averaged 1.1 cents lower for 21 associations.

Labor Output a Man-Hour

Table 14 shows the relationship of the adjusted labor cost and output a man-hour. Cost a case decreased quite consistently as output a man-hour increased. When output increased 35 cases an hour from an average of 43 cases to 78 cases, labor cost decreased 1.3 cents a case from an average of 2.9 to 1.6 cents--a decrease of 45 percent. Beyond an average output of 78 cases, the decrease in labor cost was at a slower rate. An increase of 61 cases an hour from an average of 78 to 139 cases only resulted in a decrease in labor cost of 0.7 cent a case from 1.6 to 0.9 cents.

Volume Received

Table 15 shows that direct labor receiving costs varied considerably among associations but, on the average, declined as volume increased during the 2-week period. The lowest volume group received less than 2,000 cases during the period and averaged only 1,098 cases. The average adjusted labor cost was 4.4 cents a case as compared with 2.8 cents for the middle volume group and 2.3 cents a case for the highest volume group which received an average of 10,621 cases of eggs.

[6] Two other associations performed the receiving operation but with other services which were not separable from receiving.

TABLE 13.--Receiving eggs: Average hourly direct labor cost and actual and adjusted[1] average direct labor cost per case, 21 associations, 2-week period

Area and association	Hourly labor cost	Labor cost per case		Adjusted cost less than actual cost
		Actual	Adjusted	
		Cost		
Northeast				
C	$2.26	1.9	1.0	.9
D	2.11	1.9	1.1	.8
E	2.00	1.3	.8	.5
F	1.19	2.1	2.1	.0
G	1.70	2.7	1.9	.8
H	1.86	1.7	1.1	.6
North Central				
I	1.58	4.9	3.7	1.2
J	1.19	2.1	2.1	.0
K	1.19	2.8	2.8	.0
L	1.39	2.0	1.7	.3
M	1.53	2.1	1.6	.5
N	1.60	1.7	1.3	.4
O	1.88	2.4	1.5	.9
P	1.40	2.4	2.0	.4
Q	1.86	2.3	1.5	.8
Western				
R	2.23	8.1	4.3	3.8
S	2.05	6.8	3.9	2.9
T	2.54	2.7	1.3	1.4
U	2.70	6.0	2.6	3.4
V	2.71	1.4	.6	.8
W	2.72	3.7	1.6	2.1
Averages:				
All associations	1.89	3.0	1.9	1.1
Northeast	1.85	1.9	1.3	.6
North Central	1.51	2.5	2.0	.5
Western	2.49	4.8	2.4	2.4
Range:				
Low	1.19	1.3	.6	--
High	2.72	8.1	4.3	--

[1] Adjusted to lowest average hourly direct labor cost.

Factors affecting receiving labor output a man-hour are now discussed.

Table 16 shows no close relationship between volume received and output a man hour. However, on the average, output increased as volume increased--from about 47 cases a man-hour for the lower volume group to nearly 80 cases for the middle volume group to nearly 99 cases for the largest volume group. Five associations receiving lower volumes but with labor outputs well above average had receiving equipment and a well-located receiving room that made for rapid unloading

TABLE 14.--Receiving eggs: Average output per man-hour and adjusted[1] average direct labor cost per case, 21 associations, 2-week period

Output group and association	Output per man-hour	Adjusted labor cost per case
Lowest group	*Cases*	*Cents*
R	27.7	4.3
S	30.2	3.9
I	32.1	3.7
K	42.0	2.8
U	44.7	2.6
F	56.2	2.1
P	57.2	2.0
J	57.4	2.1
Middle group		
G	63.1	1.9
L	69.3	1.7
M	72.0	1.6
W	74.0	1.6
O	79.8	1.5
Q	81.4	1.5
N	92.0	1.3
T	93.2	1.3
Highest group		
D	109.8	1.1
H	114.7	1.1
C	121.5	1.0
E	150.7	.8
V	198.1	.6
Averages:		
21 associations	79.4	1.9
Lowest group	43.4	2.9
Middle group	78.1	1.6
Highest group	139.0	.9
Range:		
Low	27.7	.6
High	198.1	4.3

[1] Adjusted to lowest average hourly direct labor cost.

of eggs from trucks and placement in the receiving room.

At one of these plants, eggs were placed on skids from the truck and moved again, but quickly, with a power lift truck. At other plants the eggs were either unloaded directly onto skids that needed no further moving during the receiving operation or onto moving belts that conveyed the eggs a short distance to the receiving area.

On the other hand, five of seven associations with outputs farthest below average used less efficient equipment such as two-wheel hand trucks or had to move eggs a greater distance to the receiving area after

they were taken off the trucks. At one of the other two associations, producers delivered more than 60 percent of the receipts. Producer deliveries were made at varying times which either took receiving laborers from other work or made for some idle time for full-time receivers.

Association V with the largest output a man-hour not only received the largest volume of eggs during the period but unloaded eggs a truckload at a time with mechanical equipment into the receiving area. Only 4 to 5 minutes were required to unload a large truckload of eggs.

TABLE 15.--Receiving eggs: Volume and average adjusted[1] labor cost per case, 21 associations, 2-week period

Volume group and association	Volume	Adjusted labor cost per case
	Cases	*Cents*
Lowest group		
R	1,024	8.1
O	1,037	2.4
S	1,043	6.8
J	1,062	2.1
K	1,323	2.8
Middle group		
H	2,581	1.7
N	2,736	1.7
I	3,302	4.9
L	3,359	2.0
G	3,943	2.7
J	4,192	6.0
E	4,219	1.3
M	4,879	2.1
Lowest group		
F	5,054	2.1
P	5,423	2.4
D	6,151	1.9
W	8,087	3.7
Q	9,641	2.3
T	11,606	2.7
C	13,847	1.9
V	25,161	1.4
Averages:		
21 associations	5,699	3.0
Lowest group	1,098	4.4
Middle group	3,651	2.8
Highest group	10,621	2.3
Range:		
Low	1,024	1.3
High	25,161	8.1

[1]Adjusted to lowest average hourly direct labor cost.

Summary of Labor Cost and Output Ranges

Associations with the highest and lowest direct labor costs and labor output in receiving eggs in each of the three regions and the causes thereof are shown in the accompanying tabulation.

Candling and Cartoning Eggs

Factors affecting operations in candling, cartoning, and packing cartoned eggs are about the same. Because of this similarity, for the purpose of analyzing the factors influencing labor cost a case and output a man-hour, the three operations have been combined here. The candling operation by itself included packing the eggs into cases; therefore, to be comparable the cartoning operation should include the packing of cartoned eggs when candling and cartoning are combined.

Candling and cartoning eggs were among the higher cost operations. The cost included direct labor,

Region	Cost or output level and association	Primary factor	Secondary factor
		Cost	
Northeast	Highest - G	Relatively low output	Relatively high hourly labor cost
	Lowest - E	Highest labor output	Nearby receiving room
North Central	Highest - I	Low labor output	Hourly labor cost one-third above lowest cost
	Lowest - N	Relatively high output	Hourly labor cost relatively low
Western	Highest - R	Lowest labor output	High hourly labor cost
	Lowest - V	Highest labor output	Mechanical unloading equipment
		Output	
Northeast	Highest - E	Moved from truck to receiving room on skids	Low percentage delivered by producers
	Lowest - F	61 percent door deliveries	--
North Central	Highest - N	Unloaded through port into receiving room	Low percentage delivered by producers
	Lowest - I	Cases from truck to two-wheel hand trucks, then to receiving room	--
Western	Highest - V	Mechanical equipment used to unload eggs	Large volume
	Lowest - U	Receiving room in basement	--

TABLE 16.--Receiving eggs: Volume and average output per man-hour, 21 associations, 2-week period

Volume group and association	Volume	Output per man-hour
	Cases	
Lowest group		
R	1,024	27.7
O	1,037	79.8
S	1,043	30.2
J	1,062	57.4
K	1,323	42.0
Middle group		
H	2,581	114.7
N	2,736	92.0
I	3,302	32.1
L	3,359	69.3
G	3,943	63.1
U	4,192	44.7
E	4,219	150.7
M	4,879	72.0
Highest group		
F	5,054	56.2
P	5,423	57.2
D	6,151	108.8
W	8,087	74.0
Q	9,641	81.4
T	11,606	93.2
C	13,847	121.5
V	25,161	198.1
Averages:		
21 associations	5,699	79.3
Lowest group	1,098	47.4
Middle group	3,651	80.0
Highest group	10,621	98.8
Range:		
Low	1,024	27.7
High	25,161	198.1

materials, depreciation and rental on equipment, inspection fees, and indirect costs chargeable to the operation. Direct costs are now discussed.

Direct Labor Costs

Direct labor was one of the important costs of candling and cartoning eggs. Direct labor cost of 23 associations ranged from a low of 34.5 cents a case to a high of 94.9 cents.

Three important causes of unit labor cost variance among associations were (1) hourly labor costs, (2) labor output a man-hour and (3) volume candled and cartoned. Other causes contributed but these were indirect since they influenced labor cost through labor output and are discussed under the causes of variation in labor output a man-hour.

Hourly Labor Costs.--Hourly labor cost for candling and cartoning varied widely among associations and was an important cause of

variations in unit labor cost. Variations among associations in hourly labor costs were caused chiefly by differences in basic wage rates, fringe benefits, and to some extent by overtime pay.

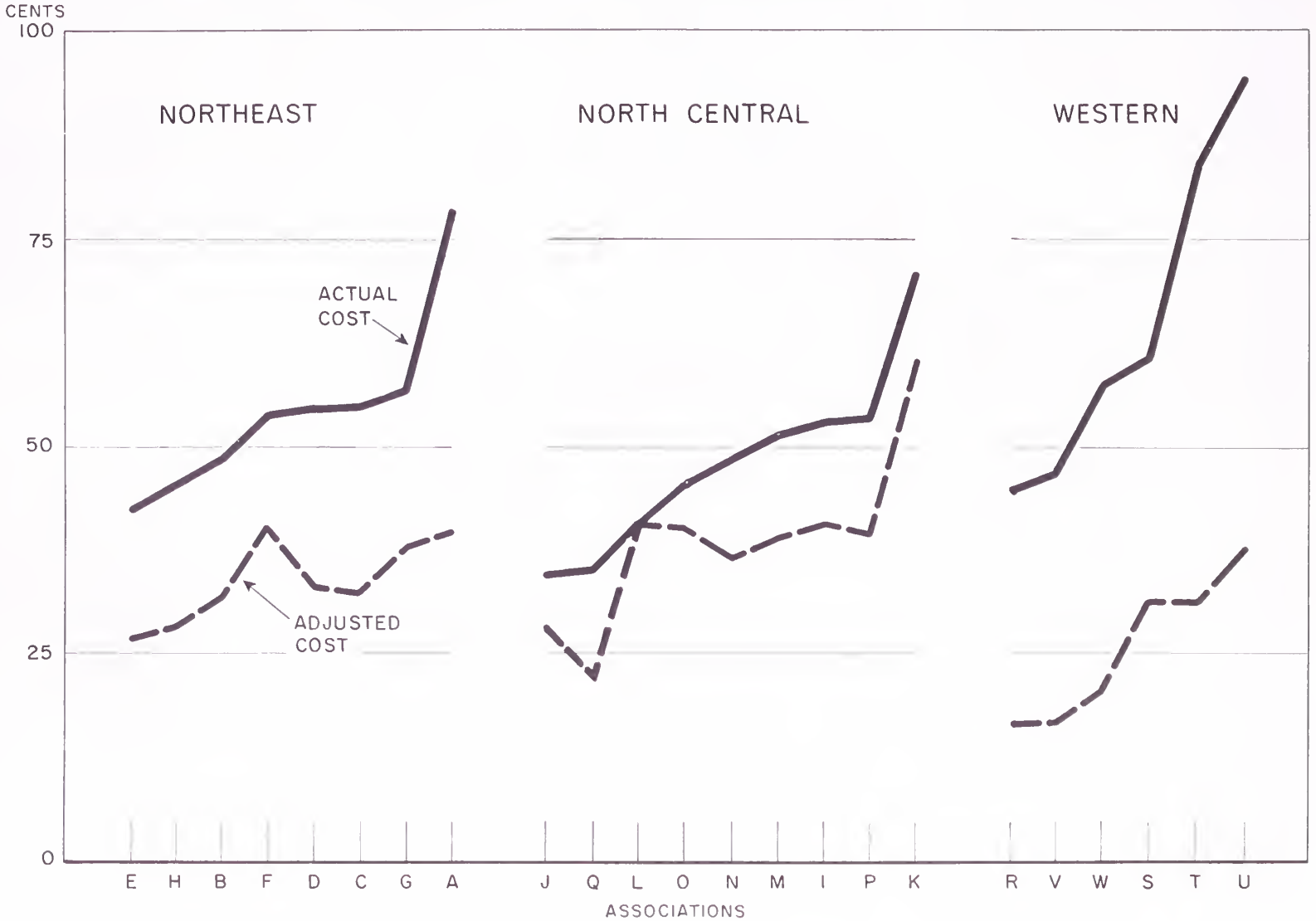
Rather than attempt to measure the effect of hourly labor costs on unit labor costs, the effect has been eliminated by adjusting actual labor cost a case to the hourly labor cost of the association with the lowest cost (table 17 and figure 2). Had the labor cost of the association with the highest hourly cost of $2.51 been the same as the one with the lowest hourly cost of 90 cents, its

TABLE 17.--Candling and cartoning eggs: Average hourly direct labor cost and actual and adjusted[1] average direct labor cost per case, 23 associations, 2-week period

Area and association	Hourly labor cost	Labor cost per case	
		Actual	Adjusted[1]
		Cents	
Northeast			
F	$ 1.20	53.9	40.4
G	1.37	56.8	37.3
B	1.38	48.5	31.6
E	1.43	42.6	26.8
H	1.45	45.3	28.1
D	1.49	54.6	33.0
C	1.54	54.9	32.1
A	1.88	83.4	39.9
North Central			
L	.90	40.9	40.9
O	1.03	45.9	40.1
K	1.07	71.7	60.3
J	1.10	34.5	28.2
I	1.18	52.8	40.3
M	1.19	51.6	39.0
N	1.20	48.3	36.2
P	1.21	53.1	39.5
Q	1.41	35.0	22.3
Western			
S	1.75	60.8	31.3
U[2]	2.29	94.9	37.3
T[2]	2.41	83.4	31.1
R	2.44	44.5	16.4
W	2.50	57.2	20.6
V	2.51	46.5	16.7
Averages:[3]			
23 associations	1.56	54.8	33.5
Northeast	1.47	55.0	33.6
North Central	1.14	48.2	38.5
Western	2.32	64.6	25.6
Range:			
Low	.90	34.5	16.4
High	2.51	94.9	60.3

[1] Adjusted to lowest average hourly direct labor cost.
[2] Does not include hand cartoning.
[3] Unweighted average.

Figure 2. Candling and cartoning eggs: Actual and adjusted[1/] average direct labor costs per case, 23 associations by areas, 2-week period.



[1/] Adjusted to lowest average hourly labor cost

candling and cartoning cost a case would have been only 16.7 cents as compared with the actual cost of 46.5 cents--a difference of nearly 30 cents a case.

The effect of hourly labor costs is particularly noticeable when the actual and adjusted case costs are compared by areas (table 17 and figure 2). Actual labor costs were highest for the Western associations and lowest for the North Central associations where hourly costs were lowest. In contrast, the adjusted costs were lowest for the Western associations and highest for the North Central ones.

Labor costs a case still varied widely after adjusting for the differences in hourly labor costs among associations--from a low of 16.4 cents to a high of 60.3 cents a case or a spread of nearly 44 cents, compared with a spread of 60.4 cents in the actual costs.

Labor Output a Man-Hour.--Labor output was an important cause of unit labor costs varying among associations, as table 18 indicates. Most of the variations in adjusted unit labor costs were explained by differences among associations in the number of cases candled and cartoned a man-hour. Unit labor cost decreased as labor output increased--and most rapidly from the lower output levels.

When labor output increased from an average of 2.3 cases for the lowest output group to 2.8 cases for the middle output group, the adjusted labor cost decreased from an average of 38.8 cents to 31 cents or at the rate of nearly 16 cents for each case increase in output. An increase in output from the average output of 2.8 cases for the middle output group to 4.5 cases for the highest group resulted in a decrease in cost from an average of 31 cents to 20.8 cents a case or at the rate of only 6 cents for each case increase in output.

The close and fairly consistent relationship of candling and cartoning labor cost and the number of cases candled and cartoned a man-hour indicated the importance of increasing or maintaining candling and cartoning labor efficiency as measured by output a man-hour.

Volume Candled and Cartoned.--Table 19 indicates no close relationship between the volume of eggs candled and cartoned and the adjusted cost. The labor cost of the middle volume group averaged higher than for the lowest volume group. However, the cost of the highest volume group averaged 25.7 cents a case--lowest of the three groups, 3.9 cents less than for the lowest volume group and 12 cents less than the middle volume group.

Some factors affecting labor output are now discussed.

Volume of Eggs.--The volume of eggs candled and cartoned as shown in table 20 was by no means the controlling factor in labor output. The labor output of some plants was far above others in the same volume group and the output of other plants was below plants in the same volume group. Association R with the highest labor output and close to the lowest volume of eggs candled was the most conspicuous example. The eggs of this association were high in quality and manually candled and graded by a small but highly efficient crew of men. Associations S and J also candled comparatively small volumes of eggs with labor output above average of associations with higher volumes. Association S

TABLE 18.--Candling and cartoning eggs: Average output per man-hour and adjusted[1] average direct labor cost per case, 22 associations, 2-week period

Output group and association	Output per man-hour	Adjusted[1] labor cost per case
Lowest group	*Cases*	*Cents*
F	2.2	40.4
I	2.2	40.3
L	2.2	40.9
A	2.3	39.9
M	2.3	39.0
O	2.3	40.1
P	2.3	39.5
D	2.4	33.0
G	2.4	37.3
U	2.4	37.3
Middle group		
N	2.5	36.2
C	2.8	32.1
E	2.8	26.8
B	2.9	31.6
J	2.9	28.2
S	2.9	31.3
T	2.9	31.1
Highest group		
H	3.2	28.1
Q	4.0	22.3
W	4.4	20.6
V	5.4	16.7
R	5.5	16.4
Averages:		
22 associations	3.0	32.2
Lowest group	2.3	38.8
Middle group	2.8	31.0
Highest group	4.5	20.8
Range:		
Low	2.2	16.4
High	5.5	40.9

[1]Adjusted to lowest average hourly direct labor cost.

had high quality eggs--only one-third of the volume was cartoned. None of the eggs at association J were cartoned.

Two factors have contributed to association R having a labor output considerably higher than average: (1) Two-thirds of the eggs were candled and packaged loose and (2) approximately 80 percent of the eggs were candled without producer identity which sped up the candling operation.

A major contributing factor to the higher than average labor output of associations W and Q was the use of

TABLE 19.--Candling and cartoning eggs: Volume and adjusted[1] direct labor cost per case, 22 associations, 2-week period

Volume group and association	Volume	Adjusted[1] labor cost per case
	Cases	*Cents*
Lowest group		
S	1,057	31.3
J	1,088	28.2
R	1,167	16.4
H	2,597	28.1
N	2,862	36.2
U	2,939	37.3
Middle group		
L	3,089	40.9
I	3,156	40.3
G	3,594	37.3
O	3,946	40.1
E	4,052	26.8
P	4,225	39.5
F	4,365	40.4
A	4,505	39.9
D	4,601	33.0
M	4,963	39.0
Highest group		
C	5,644	32.1
W	8,471	20.6
Q	9,330	22.3
T	10,894	31.1
B	15,902	31.6
V	21,191	16.7
Averages:		
22 associations	5,620	32.2
Lowest group	1,952	29.6
Middle group	4,050	37.7
Highest group	11,905	25.7
Range:		
Low	1,057	16.4
High	21,191	40.9

[1]Adjusted to lowest average hourly direct labor cost.

electro-mechanical grading and automatic packaging equipment. Association V in addition to candling and cartoning the largest volume of eggs also used electro-mechanical grading and automatic packaging equipment. Association B candled and cartoned nearly 16,000 cases but had a relatively low labor output at this volume. This was largely due to the fact that the new grading and automatic packaging equipment being used was not operating effectively during the study period.

Size of Shipments.--Size of shipments had little effect on candling labor output among associations in

TABLE 20.--Candling and cartoning eggs: Volume and average output per man-hour, 22 associations, 2-week period

Volume group and association	Volume	Output per man-hour
	Cases	
Lowest group		
S	1,057	2.9
J	1,088	2.9
R	1,167	5.5
H	2,597	3.2
N	2,862	2.5
U	2,939	2.4
Middle group		
L	3,089	2.2
I	3,156	2.2
G	3,594	2.4
O	3,946	2.3
E	4,052	2.8
P	4,225	2.3
F	4,365	2.2
A	4,505	2.3
D	4,601	2.4
M	4,963	2.3
Highest group		
C	5,644	2.8
W	8,471	4.4
Q	9,330	4.0
T	10,894	2.9
B	15,902	2.9
V	21,191	5.4
Averages:		
22 associations	5,620	3.0
Lowest group	1,952	3.2
Middle group	4,050	2.3
Highest group	11,905	3.7
Range:		
Low	1,057	2.2
High	21,191	5.5

this study furnishing such data. This is not surprising because with the use of automatic egg counting and tabulation equipment, the time of candlers in making the change from one producer's shipment to another has been greatly reduced. Most plants included in a similar study made in 1950 were without this equipment. In the earlier study, output on the average increased four times more rapidly with each case increase in size of shipments, as compared with the output of plants in the present study.

Quality of Eggs.--Among the 17 associations reporting quality of eggs candled and cartoned, output trended upward as the percentage of eggs grading A or better increased (table 21). The lowest quality group

TABLE 21.--Candling and cartoning eggs: Average quality[1] of eggs and average output per man-hour, 18 associations

Quality group and association	Quality	Output per man-hour
Lowest group	*Percent*	*Cases*
B	69.0	2.9
N	69.1	2.5
P	69.1	2.3
D	78.8	2.4
Middle group		
Q	82.0	4.0
C	83.2	2.8
O	83.4	2.3
E	85.7	2.8
F	86.2	2.2
H	86.8	3.2
Highest group		
V	87.0	5.4
E	88.4	2.4
W	88.5	4.4
T	88.9	2.9
A	88.9	2.3
U	89.8	2.4
R	90.4	5.5
S	90.9	2.9
Averages:		
18 associations		
Lowest quality	71.5	2.5
Middle quality	84.6	2.9
Highest quality	89.1	3.5
Range:		
Low	69.0	2.2
High	90.9	5.5

[1]Grade A or better.

of associations with less than 80 percent of the eggs grade A or better candled and cartoned an average of 2.5 cases a man-hour; the middle quality group averaged 2.9 cases; and the highest group with 87 percent or more eggs grading A or better averaged 3.5 cases a man-hour. However, the relationship was not highly significant because of the considerable variation in labor output among associations with similar quality eggs.

Type of Grading and Packaging Equipment.--Of 19 associations both candling and cartoning eggs and operating under normal conditions, 4 used the newest grading and automatic packaging machines, 3 used newer grading equipment without automatic packaging equipment, 9 used older types of equipment, and 3 candled and cartoned eggs by hand.

Table 22 shows that when automatic packaging equipment was used,

TABLE 22.--Candling and cartoning: Average labor output per man-hour, by type of grading and packaging equipment, 19 associations, 2-week period

Type of equipment and association	Output per man-hour
Newest grading and automatic packaging (Group 1)	*Cases*
Q	4.0
T	3.3
V	5.4
W	4.4
New but without automatic packaging (Group 2)	
D	2.4
G	2.4
H	3.2
Older equipment (Group 3)	
A	2.2
C	2.8
E	2.8
I	2.2
M	2.3
N	2.5
O	2.3
P	2.3
U	2.4
Hand operation (Group 4)	
F	2.2
L	2.2
S	2.9
Averages:	
19 associations	2.9
Group 1	4.3
Group 2	2.7
Group 3	2.4
Group 4	2.4

direct labor output averaged 4.3 cases a man-hour--1.6 cases or 59.3 percent more than the 2.7 cases for the newer type equipment without automatic packaging equipment. No difference was noted in labor output at associations using older type equipment and at those candling and cartoning by hand--which was down to 2.4 cases a man-hour in both instances.

Increased labor efficiency from the use of automated grading and packaging equipment can be offset by the additional investment, lease, or royalty cost of such equipment as compared with the older type equipment. This can be true particularly in areas where wage rates are low and labor output relatively high.

Type of Association.--As previously stated, four types of associations were included in the study--farm supply, egg and poultry, egg, and dairy. The relation of type of association to candling and cartoning output a man-hour is shown in table 23.

TABLE 23.--Candling and cartoning eggs: Type of associations in relation to average labor output per man-hour, 20 associations, 2-week period

Type and association	Output per man-hour
Farm supplies	*Cases*
F	2.2
U	2.4
T	2.9
Q	4.0
W	4.4
V	5.4
Eggs and poultry	
I	2.2
C	2.8
B	2.9
S	2.9
Egg	
A	2.3
M	2.3
D	2.4
G	2.4
E	2.8
H	3.2
Dairy	
L	2.2
O	2.3
P	2.3
N	2.5
Averages:	
All associations	2.3
Farm supplies	3.6
Eggs and poultry	2.7
Egg	2.6
Dairy	2.3

The farm supply type candled and cartoned the highest average number of eggs a man-hour--3.6 cases as compared with 2.7 cases by the egg and poultry type, 2.6 by the egg type, and 2.3 cases by the dairy type. Contributing factors to the farm supply group having the highest output were: Four of the six associations (1) used automatic packaging equipment and (2) handled large volumes of eggs.

The dairy type association with the lowest average output of 2.3 cases a man-hour candled and cartoned the lowest average volume of eggs--3,530 cases compared with 9,532 cases by the farm supplies group. The dairy type also used the older type of candling and cartoning equipment.

Materials Cost

Materials used in candling and cartoning eggs consisted largely of cases, filler-flats, and cartons. Other materials included carton seals, gummed tape, and case labels. The unit cost of materials among 18 associations that candled and cartoned eggs and purchased their own cartons varied as follows:

Average	76.5 cents a case
Range:	
Low	58.9 cents a case
High	104.5 " " "

Variations in materials cost for a 30-dozen case among associations were caused by (1) type of cases used, (2) whether all materials were new or used, (3) volume of materials used, and (4) proportion of eggs cartoned and packed loose.

Some associations used lightweight cases; others used heavier cases. Most associations used new materials but a few used old[7] cases and filler-flats to quite an extent. Users of large quantities of materials can take advantage of quantity discounts. Associations candling and cartoning more than 6,000 cases during the 2-week study period had a slightly lower average unit materials cost--74.5 cents a 30-dozen case as compared with 79.3 cents for the associations candling and cartoning less than 6,000 cases during the same period of time. The five associations in the higher volume group used mostly new materials.

Eight of the 15 associations candling and cartoning less than 6,000 cases during a 2-week period used considerable quantities of old cases and flats and fillers; otherwise, the lower volume group would have had a higher unit materials cost.

Egg cartons were not reused but some cost differences existed among associations. Among 17 associations cartons varied in cost from a low of 2.3 cents each for 4 associations to a high of 3.2 cents for 1 association. The second highest cost was 2.7 cents. The average cost was approximately 2.4 cents each. Differences in cost among associations were due to type of cartons, quantity purchases, and freight charges. Of the materials used in the consumer grade, cartoned case-packed eggs, approximately three-fourths of the cost was for cartons.

Equipment Cost

The cost of equipment includes depreciation, rent, and 5 percent interest on investment. Cost of

[7] The term old means reused cases and other materials in good condition.

repairs was not included. Cartoning equipment and some of the latest grading and automatic packaging equipment were used on a rental or royalty basis.

Equipment costs among 16 associations from which complete equipment cost data were obtained varied from a low of 1.9 cents a case for two associations to a high of 22.5 cents for an association using automatic packaging equipment. The average cost was 7 cents a case (table 24). Among associations using new equipment with automatic packaging equipment, the cost varied from 15.7 cents to 22.5 cents. This variation was due largely to the volume handled as the rental charge on the equipment used decreased as volume increased.

TABLE 24.--Candling and cartoning eggs: Average equipment cost per case by type of equipment, 16 associations, 2-week period

Type of equipment and association	Labor cost per case
Newest grading and automatic packaging (Group 1)	*Cents*
B	15.7
Q	22.5
V	15.8
W	18.0
New but without automatic packaging (Group 2)	
D	2.7
G	2.2
H	8.7
Older equipment (Group 3)	
A	3.1
C	4.1
E	3.8
F	1.9
I	1.9
M	3.3
N	3.5
O	3.0
U	2.2
Averages:	
All associations	7.0
Group 1	18.0
Group 2	4.5
Group 3	3.0
Range:	
Low	1.9
High	22.5

Among three associations using new grading equipment without automatic packaging equipment, the cost varied from 2.2 to 8.7 cents a case. Two of the three associations were using the same type of grading equipment--one with an equipment cost of 2.7 cents a case had purchased the grading equipment; the other with a cost of 8.7 cents a case was paying rental on the grading equipment. The rental charge was a fixed amount each month without regard to volume handled. Since this association handled a relatively small volume, the cost a case was relatively high. Had this association candled and cartoned the same volume as the association owning equipment, the cost would have been 4.9 cents a case instead of 8.7 cents.

The equipment cost among the associations with the older type equipment varied from a low of 1.9 cents a case for two associations to a high of 4.1 cents for one association and averaged 3.0 cents a case. The associations in this group with the lower equipment costs had less equipment than the others and at one association, cartons were closed by the candlers.

Summary of Labor Cost and Output Ranges

Associations with the highest and lowest direct labor costs and labor output in candling and cartoning eggs in each of the three regions and the causes thereof are shown in the accompanying tabulation.

Region	Cost or output level and association	Primary factor	Secondary factor
		Cost	
Northeast	Highest - A	High hourly labor cost	Low labor output
	Lowest - E	Relatively high labor output	Relatively low hourly labor cost
North Central	Highest - I	Low labor output	Hourly labor cost 31 percent above lowest cost
	Lowest - J	Low hourly labor cost	Medium labor output
Western	Highest - U	High hourly labor cost	Low labor output
	Lowest - R	High labor output	High quality eggs
		Output	
Northeast	Highest - H	Newer type grading equipment	Egg type association. Producer identity lost on 80 percent of eggs
	Low - F	Hand operation	--
North Central	Highest - Q	Electro-mechanical grading equipment	Large volume
	Lowest - L	Hand operation	Dairy type association
Western	Highest - R and V	V had electro-mechanical grading equipment and large volume	R had uniformly efficient candlers
	Lowest - U	Older type equipment	--

Coopering Cases

The cost of coopering or setting up egg cases was one of the lower cost operations. The cost was made up largely of direct labor. Depreciation of equipment and indirect plant and non-plant costs chargeable to the operation were minor so no analysis of variations of these two costs among associations was made.

The associations cooperating in this study used fiber cases almost exclusively. This marked a change from the use of wooden ones less than a decade before. Many of the associations also were using a different case for procurement than for the sale of eggs. Procurement cases were of heavy construction and reused many times. Eggs were sold in a lighter case unless being shipped long distances.

The labor required to cooper cases varied to some extent among associations. Collapsible procurement cases required little attention in a plant other than receiving them and checking reused cases and flats and fillers or filler-flats for return to farms. Other types of new procurement and sales cases had to be set up in the plants. Where automatic case closers and sealers were used, the egg packers set up the sales cases instead of a coopering crew. The time of the egg packers required to set up egg cases was estimated and charged to the coopering operation.

Important factors affecting the direct labor costs among associations are now discussed.

Hourly Labor Costs

Hourly labor costs for coopering cases varied widely among the associations studied and among the areas where they were located (table 25). They ranged from a low of 82 cents for association J in the North Central area to a high of $2.95 for association D in the Northeast area. By areas the hourly cost ranged from an average of $1.19 in the North Central to $2.21 in the Western area.

The effect of variations in hourly coopering labor cost among associations was accounted for by adjusting the actual labor costs a case to the lowest average hourly cost of 82 cents a case. Table 25 shows the actual cost a case for each association and what it would have been had the hourly cost been the same as the association with the lowest hourly labor cost. For example, association R would have had a cost of 2 cents a case instead of 5 cents. The average cost of 23 associations would have been 1.4 cents a case instead of 2.6 cents or 46 percent lower. The average adjusted cost by areas was nearly the same.

Table 25 also shows the spread between the actual and adjusted labor cost for each association. The spread ranged to as much as 2.8 cents a case for one association. Wide variations in coopering labor costs a case still existed among associations after adjusting for differences in hourly labor costs.

Labor Output a Man-Hour

The effect of labor output on the adjusted cost a case is shown in table 26. The adjusted cost decreased consistently as cases coopered a man-hour increased. When output increased 18 cases from an average of nearly 42 cases a man-hour to about 60 cases, the labor cost decreased 0.6 cent a case. When output nearly tripled from the average of 60 cases to nearly 173 cases, the average cost decreased 0.8 of a cent--or at a slower rate than from the lowest to middle output average.

Volume Coopered

Table 27 shows the effect of the volume of cases coopered during the period on the adjusted cost a case. Although not consistent, the adjusted labor cost decreased as the volume of cases coopered increased. Five associations each coopered less than 2,000 cases during the period and averaged 1,063 cases. The average labor cost was

2.2 cents a case as compared with 1.3 cents a case for the middle group coopering an average of 5,000 cases, and 1.1 cents for the highest volume group coopering an average of nearly 19,700 cases. The labor cost for the highest group was only 0.2 cent a case less than for the middle group which coopered only one-fourth as many cases.

Factors affecting coopering labor output are now discussed. The study did not provide data and information

TABLE 25.--Coopering cases: Average hourly direct labor cost and actual and adjusted[1] average direct labor cost per case, 23 associations, 2-week period

Area and association	Hourly labor cost	Labor cost per case		Difference in cost per case
		Actual	Adjusted	
		Cents		
Northeast				
A	$1.61	2.5	1.3	1.2
B	1.20	3.1	2.1	1.0
C	1.47	3.2	1.8	1.4
D	2.95	2.1	.6	1.5
E	1.30	2.7	1.7	1.0
F	1.18	2.0	1.4	.6
G	1.53	3.0	1.6	1.4
H	1.59	1.6	.8	.8
North Central				
I	1.31	2.1	1.3	.8
J	.82	1.4	1.4	.0
K	1.19	5.3	3.7	1.6
L	1.27	2.7	1.7	1.0
M	1.27	0.9	.6	.3
N	1.23	2.0	1.3	.7
O	.91	1.5	1.4	.1
P	1.31	2.8	1.8	1.0
Q	1.41	0.5	.3	.2
Western				
R	2.04	5.0	2.0	.3
S	1.71	4.5	2.2	2.3
T	2.39	4.0	1.4	2.6
U	2.13	4.5	1.7	2.8
V	2.50	1.6	.5	1.1
W	2.52	1.4	.5	.9
Averages:				
All associations	1.61	2.6	1.4	1.2
Northeast	1.60	2.5	1.4	1.1
North Central	1.19	2.1	1.5	.6
Western	2.21	3.5	1.4	2.1
Range:				
Low	.82	1.5	.3	.0
High	2.95	5.3	3.7	2.8

[1] Adjusted to lowest average hourly direct labor cost.

TABLE 26.--Coopering cases: Average output per man-hour and adjusted[1] average direct labor cost per case, 23 associations, 2-week period

Output groups and associations	Output per man-hour	Adjusted labor cost per case
Lowest group	*Cases*	*Cents*
K	22.2	3.7
S	37.9	2.2
B	38.8	2.1
R	39.6	2.0
G	44.9	1.6
C	45.9	1.8
L	46.8	1.7
P	47.1	1.8
U	47.3	1.7
E	48.8	1.7
Middle group		
J	56.8	1.4
F	58.5	1.4
T	59.8	1.4
I	60.0	1.3
N	61.2	1.3
O	61.5	1.4
A	65.2	1.3
Highest group		
H	102.2	.8
D	141.3	.6
M	146.5	.6
V	163.3	.5
W	181.1	.5
Q	301.1	.3
Averages:		
23 associations	81.6	1.4
Lowest group	41.9	2.0
Middle group	60.4	1.4
Highest group	172.6	.6
Range:		
Low	22.2	.3
High	301.1	3.7

[1]Adjusted to lowest average hourly direct labor cost.

that afforded an accurate statistical measure of the causes of variations in coopering labor output a man-hour among associations. However, as shown in table 28, associations with large volumes coopered more cases a man-hour than those with smaller volumes. Eight associations coopering less than 3,800 cases and an average of 1,940 cases during a 2-week period averaged 45 cases a man-hour. Eight associations averaging 5,606 cases during a 2-week period had an average labor output of 83 cases a man-hour. The output of the upper volume group

TABLE 27.--Coopering cases: Volume and adjusted[1] average direct labor cost per case, 23 associations, 2-week period

Volume group and association	Volume	Adjusted labor cost per case
Lowest group	*Cases*	*Cents*
R	635	2.0
S	1,043	2.2
J	1,050	1.4
G	1,088	1.6
K	1,500	3.7
Middle group		
N	3,000	1.3
L	3,590	1.7
E	3,614	1.7
O	3,811	1.4
I	4,500	1.3
P	5,275	1.8
D	5,901	.6
U	5,946	1.7
H	6,028	.8
F	6,248	1.4
M	7,142	.6
Highest group		
T	12,644	1.4
C	13,847	1.8
W	16,072	.5
B	18,610	2.1
Q	18,971	.3
A	22,018	1.3
V	35,731	.5
Averages:		
23 associations	8,620	1.4
Lowest group	1,063	2.2
Middle group	5,005	1.3
Highest group	19,699	1.1
Range:		
Low	635	.3
High	35,731	3.7

[1]Adjusted to lowest average hourly direct labor cost.

averaged 122 cases a man-hour with an average volume of nearly 20,000 cases.

Unmeasurable factors causing variations in labor output were: (1) Different types of cases used, (2) different methods of setting up cases, and (3) separate type of cases for procurement than for sales.

Some associations shipping eggs long distances to market needed heavier cases than for nearby sales. Such cases have a heavy liner and more time is required to set up or

assemble them than is required for the lighter cases.

At plants equipped with labor saving machinery, cases for market eggs were set up by the egg packers with somewhat less labor time, as compared with the conventional method of using a separate coopering crew.

Plants using different cases for procurement than for sales had a higher output a man-hour than those using one, or mostly one, type of case for both. Procurement cases were usually the collapsible type and set up by the producer. All procurement cases were reused many times, thus requiring a minimum of labor for the coopering operation.

Summary of Labor Cost and Output Ranges

Associations with the highest and lowest direct labor costs and labor output in coopering egg cases in each of the three regions and the causes thereof are shown in the accompanying tabulation.

TABLE 28.--Coopering cases: Volume and average output per man-hour, 23 associations, 2-week period

Association	Volume	Output per man-hour
	Cases	
Lower volume group		
R	635	40
S	1,043	38
J	1,050	57
G	1,088	45
K	1,500	22
N	3,000	61
L	3,590	47
E	3,614	49
Middle volume group		
O	3,811	62
I	4,500	60
P	5,295	47
D	5,901	141
U	5,946	47
H	6,028	102
F	6,248	58
M	7,142	146
Upper volume group		
T	12,644	60
C	13,847	46
W	16,072	181
B	18,610	39
Q	18,971	301
A	22,018	65
V	35,731	163
Averages:		
All associations	8,620	82
Lower volume group	1,940	45
Middle volume group	5,606	83
Upper volume group	19,699	122

Region	Cost or output level and association	Primary factor	Secondary factor
		Cost	
Northeast	Highest - C	Relatively low labor output	Hourly labor cost relatively high
	Lowest - H	High labor output	--
North Central	Highest - K	Lowest output	Hourly labor cost nearly 50 percent above lowest cost
	Lowest - Q	Highest labor output	Large volume
Western	Highest - R	Low labor output	High hourly labor cost. Small volume
	Lowest - W	High labor output	Large volume
		Output	
Northeast	Highest - D	Large volume	Farm cases reused
	Lowest - B	Only 58 percent of cases returned to farmers	--
North Central	Highest - Q	Large volume	Collapsible farm cases reused
	Lowest - K	Small volume	Cases not returned to farms
Western	Highest - W	Reused collapsible field cases	--
	Lowest - S	Small volume	--

Stacking Eggs

The cost of stacking eggs in the holding room was relatively small, but varied considerably among associations. This cost included direct labor, depreciation of holding room and equipment, and indirect costs. Since the depreciation costs were a minor part of total stacking costs, no analysis was made of them. The direct labor costs and factors affecting them are now discussed.

Direct labor was the principal cost of stacking eggs. At most associations, eggs were manually conveyed to the holding room on skids. A few associations used moving belts to transfer eggs to the holding room where laborers removed them from the belt and stacked them.

Important factors affecting direct labor costs among associations are discussed below.

Hourly Labor Costs

Hourly labor costs for stacking eggs averaged from a low of $1.15

for an association in the North Central area to a high of $2.78 for an association in the Western area. The average cost for 21 associations was $1.84. By areas the hourly cost averaged $1.75, $1.38, and $2.51 in the Northeast, North Central, and Western areas, respectively (table 29).

The effect of differences in hourly labor costs was accounted for by adjusting the actual stacking labor cost a case to the lowest hourly cost of $1.15 paid by one association. Actual and adjusted costs are shown in table 29. Association U with a high hourly labor cost and an actual case cost of 3 cents would have had

TABLE 29.--Stacking eggs: Average hourly direct labor cost and actual and adjusted[1] average direct labor cost per case, 21 associations, 2-week period

Area and association	Hourly labor cost	Labor cost per case		Amount adjusted cost was less than actual cost
		Actual	Adjusted	
		Cents		
Northeast				
A	$1.68	2.1	1.4	0.7
B	1.48	2.3	1.8	.5
C	2.29	1.9	1.0	.9
D	2.32	1.4	.7	.7
E	1.36	1.6	1.4	.2
F	1.25	1.5	1.4	.1
G	1.82	3.4	2.1	1.3
H	1.78	1.7	1.1	.6
North Central				
K	1.18	1.3	1.3	.0
L	1.15	.9	.9	.0
M	1.43	1.8	1.4	.4
N	1.31	2.0	1.8	.2
O	1.48	.8	.6	.2
P	1.35	1.4	1.2	.2
Q	1.73	2.0	1.3	.7
Western				
R	2.43	1.0	.5	.5
S	2.06	2.5	1.4	1.1
T	2.60	2.4	1.1	1.3
U	2.64	3.0	1.3	1.7
V	2.56	2.2	1.0	1.2
W	2.78	0.9	.4	.5
Averages:				
All associations	1.84	1.8	1.2	.6
Northeast	1.75	2.0	1.4	.6
North Central	1.38	1.6	1.2	.4
Western	2.51	2.0	.9	1.1
Range:				
Low	1.15	.8	.4	--
High	2.78	3.4	2.1	--

[1] Adjusted to lowest average hourly direct labor cost.

TABLE 30.--Stacking eggs: Average output per man-hour and adjusted[1] average direct labor cost per case, 21 associations, 2-week period

Output group and association	Output per man-hour	Adjusted labor cost per case
Lowest group	*Cases*	*Cents*
G	53.7	2.1
B	64.1	1.8
N	65.8	1.8
A	78.6	1.4
F	81.2	1.4
M	81.4	1.4
S	83.1	1.4
E	84.7	1.4
Middle group		
U	86.8	1.3
Q	88.4	1.3
K	93.6	1.3
P	97.6	1.2
H	107.5	1.1
V	116.3	1.0
T	119.7	1.1
Highest group		
C	120.1	1.0
L	124.8	.9
D	162.9	.7
O	174.7	.6
R	233.4	.5
W	325.9	.4
Averages:		
21 associations	116.4	1.2
Lowest group	74.1	1.6
Middle group	101.4	1.2
Highest group	190.3	.7
Range:		
Low	53.7	.4
High	325.9	2.1

[1] Adjusted to lowest average hourly direct labor cost.

a case cost of only 1.3 cents had the hourly cost been the same as that of the association with the lowest hourly cost. By areas, the actual case cost averaged lowest for the North Central area. After adjusting for effect of differences in hourly costs, the Western area had the lowest average case cost and the Northeast the highest.

Labor Output a Man-Hour

Table 30 shows that the differences in the adjusted labor costs a case were largely explained by the variations in labor output a man-hour among associations. The cost decreased quite consistently as the number of cases stacked a man-hour increased but at a decreasing rate

among the associations with higher outputs. For the lowest output group averaging 74 cases a man-hour, the labor cost averaged 1.6 cents a case.

When the average output increased 27 cases to 101 cases, labor cost decreased 0.4 cent a case from 1.6 to 1.2 cents. The average output for the highest group was 190 cases a man-hour or 89 cases more than the average of the middle group but the labor cost only increased one-half cent a case.

Volume Stacked

Table 31 shows a slight downward trend in the adjusted labor cost as volume among associations increased but the relationship was not

TABLE 31.--Stacking eggs: Volume and adjusted[1] average direct labor cost per case, 21 associations, 2-week period

Volume group and association	Volume	Adjusted labor cost per case
Lowest group	*Cases*	*Cents*
R	1,167	0.5
S	1,267	1.4
K	1,451	1.3
H	2,579	1.1
N	2,862	1.8
Middle group		
L	3,089	.9
U	3,601	1.3
O	3,756	.6
G	3,950	2.1
E	4,172	1.4
P	4,222	1.2
F	4,365	1.4
D	4,601	.7
M	4,963	1.4
Highest group		
W	7,985	.4
Q	9,330	1.3
T	12,681	1.1
C	13,847	1.0
B	18,882	1.8
V	21,191	1.0
A	22,078	.4
Averages:		
21 associations	7,240	1.1
Lowest group	1,865	1.2
Middle group	4,080	1.2
Highest group	15,142	1.0
Range:		
Low	1,167	.4
High	22,078	2.1

[1]Adjusted to lowest average hourly direct labor cost.

TABLE 32.--Stacking eggs: Volume and average output per man-hour, 21 associations, 2-week period

Association	Volume	Output per man-hour
		Cases
Lower volume group		
R	1,167	233
S	1,267	83
K	1,451	94
H	2,579	108
N	2,862	66
L	3,089	125
U	3,601	87
O	3,756	175
G	3,950	54
E	4,172	85
Upper volume group		
P	4,222	98
F	4,363	81
D	4,601	163
M	4,963	81
W	7,985	326
Q	9,330	88
T	12,681	120
C	13,847	120
B	18,882	64
V	21,191	116
A	22,078	79
Averages:		
21 associations	7,287	116
Lower group	2,789	111
Higher group	11,377	122
Range:		
Low	1,167	54
High	22,078	233

significant. Some associations with similar volumes had widely varying labor costs a case. The average cost of the volume group handling between 3,000 and 5,000 cases was 1.2 cents a case--only 0.2 cent more a case than for the group handling more than 5,000 and up to 22,000 cases. Associations handling less than 3,000 cases also had a labor cost of 1.2 cents a case.

Data and information obtained did not effectively explain variations in stacking-labor output amont the associations. Ten associations with the lowest average quantity of eggs stacked during the 2-week period had a slightly lower output than 11 associations with the highest average quantity stacked--111 cases a man-hour, compared with 122 cases (table 32). However, association R with the lowest volume stacked had the second highest output a man-hour, 233 cases.

Most associations with the higher labor outputs had an efficient stacking operation in that the holding room was adjacent to the egg processing area and equipment used such as skids and roller or belt conveyors required a minimum amount of labor

to operate. At a few plants where eggs were transported to the holding room on roller or belt conveyors, one or more men were kept in the holding room full-time to stack eggs removed from the conveyors and assist with loading out eggs. Apparently their time was not always fully utilized as stacking output was not as high as at some plants where similar equipment was used with less labor.

At one plant with a relatively high output, the conveyor extended along two sides of the holding room. This arrangement made it possible to push a large number of cases into the holding room before it was necessary for an employee to go into the room and stack the eggs.

Such conditions affected labor output but were difficult to measure statistically.

Summary of Labor and Output Ranges

Associations with highest and lowest direct labor costs and labor output in stacking eggs in each of three regions and the causes thereof are shown in the accompanying tabulation.

Region	Cost or output level and association	Primary factor	Secondary factor
		Cost	
Northeast	Highest - G	Lowest labor output	Highest hourly labor cost
	Lowest - D	High labor output	Stacking area near packing station
North Central	Highest - N and Q	Labor output relatively low	Q had relatively high hourly labor cost
	Lowest - O	High labor output	Relatively low hourly labor cost
Western	Highest - U	High hourly labor rate	Low labor output
	Lowest - W	Highest labor output	Large volume
Northeast	Highest - D	Skid loads of eggs moved to nearby holding room with power lift truck	--
	Lowest - G	Time of man in holding room not fully utilized	--
North Central	Highest - O	Cases pushed into holding room on roller track conveyor	Long conveyor in holding room required only occasional unloading to stacks.
	Lowest - N	Comparatively small volume	Time of stacker not fully utilized
Western	Highest - W	From grading to holding room on skids	Holding room near to processing area
	Lowest - U	Holding room upstairs	--

Loading Out Eggs

The cost of loading out eggs included direct labor, depreciation on loading out equipment, and indirect costs. Direct labor was the major cost. Depreciation costs were not determined but were a minor item. Direct labor costs and factors affecting them are now discussed.

Hourly Labor Costs

Associations varied widely, particularly from area to area, in the average hourly loading out labor cost--from a low of $1.19 for association K in the North Central area to a high of $3.12 for association U in the Western area. For 20 associations the cost averaged $1.95 an hour. By areas the labor cost averaged $1.89, $1.43, and $2.63 for the Northeast, North Central, and Western, respectively (table 33).

As in other operations, the effect of hourly labor costs on labor costs a case was accounted for by adjusting the actual labor cost a case to the lowest average hourly cost of $1.19 for one association. Table 33 shows the actual and adjusted costs a case and differences between the two costs. Association U had the highest hourly labor cost of $3.12 and the highest labor cost a case of 10.6 cents. Had its hourly labor cost been only $1.19, the cost a case would have been only 4 cents instead of 10.6 cents. Both the actual and adjusted labor cost a case averaged highest in the Western area.

Labor Output a Man-Hour

Differences in the adjusted loading-out labor cost a case among associations in relation to labor output a man-hour among associations are shown in table 34. The relationship was significant as the cost a case declined quite consistently as output increased. At an average output of about 53 cases a man-hour, the adjusted labor cost averaged 2.5 cents a case. When the average output increased 32 cases to 85 cases a man-hour, the labor cost was about 1.4 cents a case or a decrease of 1.1 cents. Over the next increase of 81 cases from 80 cases a man-hour, the cost decrease was only 0.8 cents a case.

Volume Loaded Out

Volume of eggs loaded out appeared to have no effect on the adjusted labor cost a case. The labor cost was actually slightly more a case for the large volume associations than for the small ones (table 35).

Factors affecting variations in labor output among associations are now discussed.

Type of Equipment Used.--Ten of the 20 associations loaded out 90 or more cases of eggs a man-hour. All but one of these 10 associations loaded the eggs directly into trucks from the holding room by means of roller conveyors or a combination of roller conveyors and stevedores to elevate eggs into the trucks. The other association transferred eggs from the holding room into trucks on skids. The skids remained in the trucks with the eggs stacked upon them, thus no rehandling of cases was necessary.

Two associations which loaded out less than 90 cases of eggs a man-hour used equipment similar to that described above. One of these used roller conveyors and a stevedore but did not stack the eggs in the

TABLE 33.--Loading out eggs: Average hourly direct labor cost and actual and adjusted[1] average direct labor cost per case, 20 associations, 2-week period

Area and association	Hourly labor cost	Labor cost per acre		Amount adjusted cost below actual
		Actual	Adjusted	
		Cents		
Northeast				
B	$1.53	2.0	1.6	0.4
C	2.13	2.8	1.6	1.2
D	2.37	4.1	2.1	2.0
E	2.26	2.5	1.3	1.2
F	1.22	1.0	1.0	.0
G	1.82	1.9	1.2	.7
H	1.92	1.0	.6	.4
North Central				
I	1.54	1.9	1.5	.4
K	1.19	.9	.9	.0
L	1.22	.5	.5	.0
M	1.42	1.6	1.3	.3
O	1.56	1.0	.8	.2
P	1.38	.9	.8	.1
Q	1.72	1.2	.8	.4
Western				
R	2.31	2.4	1.2	1.2
S	2.00	3.0	1.8	1.2
T	2.90	5.5	2.3	3.2
U	3.12	10.6	4.0	6.6
V	2.66	4.8	2.1	2.7
W	2.81	3.8	1.6	2.2
Averages:				
All associations	1.95	2.7	1.4	1.3
Northeast	1.89	2.2	1.3	.9
North Central	1.43	1.1	.9	.2
Western	2.63	5.0	2.2	2.8
Range:				
Low	1.19	.5	.5	--
High	3.12	10.6	4.0	--

[1] Adjusted to lowest average hourly direct labor cost.

holding room convenient to the conveyors so more time was required to load out the eggs. The other association placed eggs in trucks on skids. But other information obtained did not explain why the labor output there was less than at the association where the eggs were loaded out in a similar manner and with a greater labor output.

At the remaining eight associations, various circumstances contributed to comparatively low labor outputs. These included moving eggs from holding rooms located some distance from loading out docks, manually transferring cases from skids to trucks at the loading out dock, moving eggs with two-wheel hand trucks from holding room to

trucks, and moving eggs from basement on elevators and then to the trucks.

Output a Man-Hour.--No relation was found to exist between the volume of eggs loaded out and output a man-hour during the 2-week period. This held true even among the associations using the more efficient methods and equipment.

Summary of Labor Cost and Output Ranges

Associations with the highest and lowest direct labor costs and labor output in loading out eggs in each of three regions and the causes thereof are shown in the accompanying tabulation.

TABLE 34.--Loading out eggs: Average output per man-hour and adjusted[1] average direct labor cost per case, 20 associations, 2-week period

Output group and association	Output per man-hour	Adjusted labor cost per case
Lowest group	*Cases*	*Cents*
U	30	4.0
T	53	2.3
V	56	2.1
D	58	2.1
S	66	1.8
Middle group		
W	75	1.6
B	76	1.6
C	77	1.6
I	79	1.5
E	89	1.3
M	90	1.3
R	95	1.2
G	98	1.2
Highest group		
F	118	1.0
K	131	.9
Q	142	.8
P	154	.8
O	157	.8
H	196	.6
L	266	.5
Averages:		
20 associations	105	1.4
Lowest	53	2.5
Middle	85	1.4
Highest	166	.8
Range:		
Low	30	.5
High	266	4.0

[1] Adjusted to lowest average hourly direct labor cost.

Region	Cost or output level and association	Primary factor	Secondary factor
		Cost	
Northeast	Highest - D	High hourly labor cost	Low labor output
	Lowest - F and H	High labor output	F had low hourly labor cost
North Central	Highest - I	Relatively low labor output	Relatively high hourly labor cost
	Lowest - L	Highest labor output	Low hourly labor rate
Western	Highest - U	Highest hourly labor cost	Lowest labor output
	Lowest - R	Highest labor output	Eggs moved by stevedore directly from holding room to truck
		Output	
Northeast	Highest - H	Eggs loaded into truck from holding room on roller conveyor	Stacked eggs convenient to conveyor
	Lowest - D	No discernible cause	--
North Central	Highest - L	Conveyor direct from holding room to truck	--
	Lowest - M	Time of loader not fully utilized	--
Western	Highest - R	Stevedore used to convey eggs directly into truck	--
	Lowest - U	Eggs to truck on skids	Holding room not convenient to loading dock

Delivering Eggs

This analysis of egg delivering costs and labor output includes only 8 of 13 associations that delivered eggs in association owned trucks. Five associations did not have enough information on this operation to make possible a complete analysis of their costs.

Egg delivering costs were made up of two items--direct labor and truck expense.[8]

[8] Truck expense consists of depreciation, gasoline and oil, tire replacement, repairs, insurance, and licenses and taxes.

Some causes of differences in delivery costs a case among associations are now discussed.

Hourly Labor Costs

The effect of variations in hourly labor costs was accounted for by adjusting the actual labor cost a case to the lowest average hourly labor cost of $1.21 for one association. Table 36 shows the hourly collecting labor cost for eight associations that used their own trucks in delivering eggs, actual and adjusted labor cost a case, truck expense a case, and delivering costs

TABLE 35.--Loading out eggs: Volume and adjusted[1] average direct labor cost per case, 20 associations, 2-week period

Volume group and association	Volume	Adjusted labor cost per case
Lower group	*Cases*	*Cents*
R	977	1.2
S	1,166	1.8
K	1,280	.9
H	2,503	.6
I	3,052	1.5
L	3,529	.5
O	3,536	.8
G	3,910	1.2
U	4,027	4.0
F	4,546	1.0
E	4,557	1.3
D	4,601	2.1
Higher group		
P	5,055	.8
M	5,091	1.3
W	8,471	1.6
Q	9,707	.8
T	11,961	2.3
C	14,295	1.6
B	19,630	1.6
V	22,148	2.1
Averages:		
20 associations	6,702	1.4
Lower group	3,140	1.4
Higher group	12,045	1.5
Range:		
Low	977	.5
High	22,148	4.0

[1] Adjusted to lowest average hourly direct labor cost.

a case including the adjusted labor cost.

Hourly labor costs varied widely among associations--from a low of $1.21 for an association in the Northeast to a high of $2.92 for one association in the Western area. The Northeast area had the lowest average of $2.16 an hour--70 cents lower than the $2.86 average in the Western area. After the adjustment, for example, average labor cost a case for the association V with the highest labor cost of $2.92 an hour was 1.4 cents--instead of 3.3 cents--a drop of 1.9 cents a case.

The adjusted total direct delivering cost ranged from 1.9 cents to 12.8 cents a case lower than the actual cost incurred (table 36).

Wide differences in the direct cost a case still existed after adjusting the labor cost for differences in labor costs an hour.

Labor Output a Man-Hour

Table 37 shows the relationship of labor output a man-hour to the direct labor cost a case with the labor cost adjusted for the effect of differences in hourly labor rates. The cost decreased as output increased but there was not a consistent relationship. The average adjusted cost of the higher output group was 10.3 cents a case or 6 cents less than the average of the lower group. Output of the higher group averaged 28 cases more a man-hour than that of the lower group.

Volume Delivered

As shown in table 38, the adjusted total delivery cost trended downward as volume increased but there were wide differences among associations with similar volume levels. Two associations delivering less than 2,000 cases during the period had an average delivery cost of 16.7 cents a case as compared with 14.6 cents for those averaging about 3,600 cases, and 10.3 cents a case for two associations delivering more than 7,000 cases.

TABLE 36.--Delivering eggs: Average hourly direct labor cost and actual and adjusted[1] average direct cost per case, 8 associations, 2-week period

Area[2] and association	Hourly labor cost	Labor cost per case		Truck expense	Total cost		Adjusted cost less than actual
		Actual	Adjusted		Actual	Adjusted	
				Cents			
Northeast							
F	$1.21	4.8	4.8	5.4	10.2	10.2	0.0
H	1.93	9.9	6.2	14.6	24.5	20.8	3.7
D	2.25	13.9	7.5	13.9	27.8	21.4	6.4
E	2.67	11.6	5.3	10.4	22.0	15.7	6.3
G	2.74	22.9	10.1	3.7	26.6	13.8	12.8
Western							
U	2.76	14.9	6.5	6.5	21.4	13.0	8.4
W	2.91	15.1	6.3	6.3	21.4	12.6	8.8
V	2.92	3.3	1.4	3.6	6.9	5.0	1.9
Averages:							
8 associations	2.42	12.1	6.0	8.0	20.1	14.1	6.0
Northeast	2.16	12.6	6.8	9.6	22.2	15.2	7.0
Western	2.86	11.1	4.7	5.5	16.6	10.2	6.4
Range:							
Low	1.21	3.3	1.4	3.6	6.9	5.0	--
High	2.92	22.9	10.1	14.6	27.8	21.4	--

[1] Adjusted to lowest average hourly direct labor cost.
[2] North Central associations either used contract haulers or did not have enough information on this operation to make possible a complete analysis of their costs.

TABLE 37.--Average output per man-hour and adjusted[1] average direct cost per case, 8 associations, 2-week period

Output group and association	Output per man-hour	Adjusted cost per case[2]
Lower group	*Cases*	*Cents*
G	11.9	13.8
D	16.2	21.4
U	18.5	13.0
W	19.2	12.6
H	19.5	20.8
Higher group		
E	23.1	15.7
F	25.0	10.2
V	87.3	5.0
Averages:		
8 associations	27.6	14.1
Lower group	17.1	16.3
Higher group	45.1	10.3
Range:		
Low	11.9	5.0
High	87.3	21.4

[1]Adjusted to lowest average hourly direct labor cost.
[2]Includes truck expense.

Table 39 shows the effect of the volume of eggs delivered in association-owned trucks on the number of cases delivered a man-hour. Some relationship is indicated. On the average, output increased as volume increased but four associations delivering about the same volume of eggs had a considerable variation in labor output.

Association W with the largest volume and highest output in some instances collected eggs from ranches or stations, delivered eggs, and picked up and delivered farm supplies on the same trip. Two associations delivered more than 6,000 cases of eggs. Their average output was 55.2 cases a man-hour or nearly 37 cases more than six associations delivering less than 4,000 cases.

Distances from plant to point of delivery and number of stops made in making deliveries also affected labor output. These factors varied among plants in the study but data obtained was insufficient to measure their effect.

Summary of Labor Cost and Output Ranges

Associations with the highest and lowest direct labor costs and labor output in delivering eggs in each of three regions and the causes thereof are shown in the accompanying tabulation.

Region	Cost or output level and association	Primary factor	Secondary factor
		Cost	
Northeast	Highest - G	Lowest labor output	High hourly labor cost
	Lowest - F	Lowest hourly labor cost	High labor output
North Central	Highest - N	Drivers paid a commission	--
	Lowest - Q	Drivers paid by the trip	--
Western	Highest - W	High hourly labor rate	Relatively low labor output
	Lowest - V	Highest labor output	Some eggs delivered and collected on same trip
		Output	
Northeast	Highest - F	Eggs delivered to buyer's warehouse	Relatively short haul
	Lowest - G	Numerous stops made	--
North Central			Hours not available
Western	Highest - V	Large volume	Some eggs delivered and collected on same trip
	Lowest - U	Comparatively small volume	--

TABLE 38.--Delivering eggs: Volume and adjusted[1] direct cost per case, 8 associations, 2-week period

Volume group and association	Volume	Adjusted cost per case
Lowest group	*Cases*	*Cents*
H	1,290	20.8
W	1,790	12.6
Middle group		
F	3,348	10.2
D	3,630	21.4
U	3,673	13.0
G	3,728	13.8
Highest group		
E	6,859	15.7
V	21,552	5.0
Averages:		
8 associations	5,734	14.1
Lowest group	1,540	16.7
Middle group	3,595	14.6
Highest group	14,205	10.3
Range:		
Low	1,290	5.0
High	21,552	21.4

[1]Adjusted to lowest average hourly labor cost.

TABLE 39.--Delivering eggs: Volume and average output per man-hour, 8 associations, 2-week period

Volume group and association	Volume	Output per man-hour
		Cases
Lower group		
H	1,290	19.5
W	1,790	19.2
F	3,348	25.0
D	3,630	16.2
U	3,673	18.5
G	3,728	11.9
Higher group		
E	6,859	23.1
W	21,552	87.3
Averages:		
8 associations	5,734	27.6
Lower group	2,910	18.4
Higher group	14,206	55.2
Range:		
Low	1,290	11.9
High	21,552	87.3

Factors Affecting Indirect Costs

Indirect costs were divided into two groups--plant and non-plant. Plant costs were further divided into (1) salaries, (2) other indirect less depreciation, and (3) depreciation. Non-plant costs were divided into (1) salaries and (2) other indirect costs including depreciation.

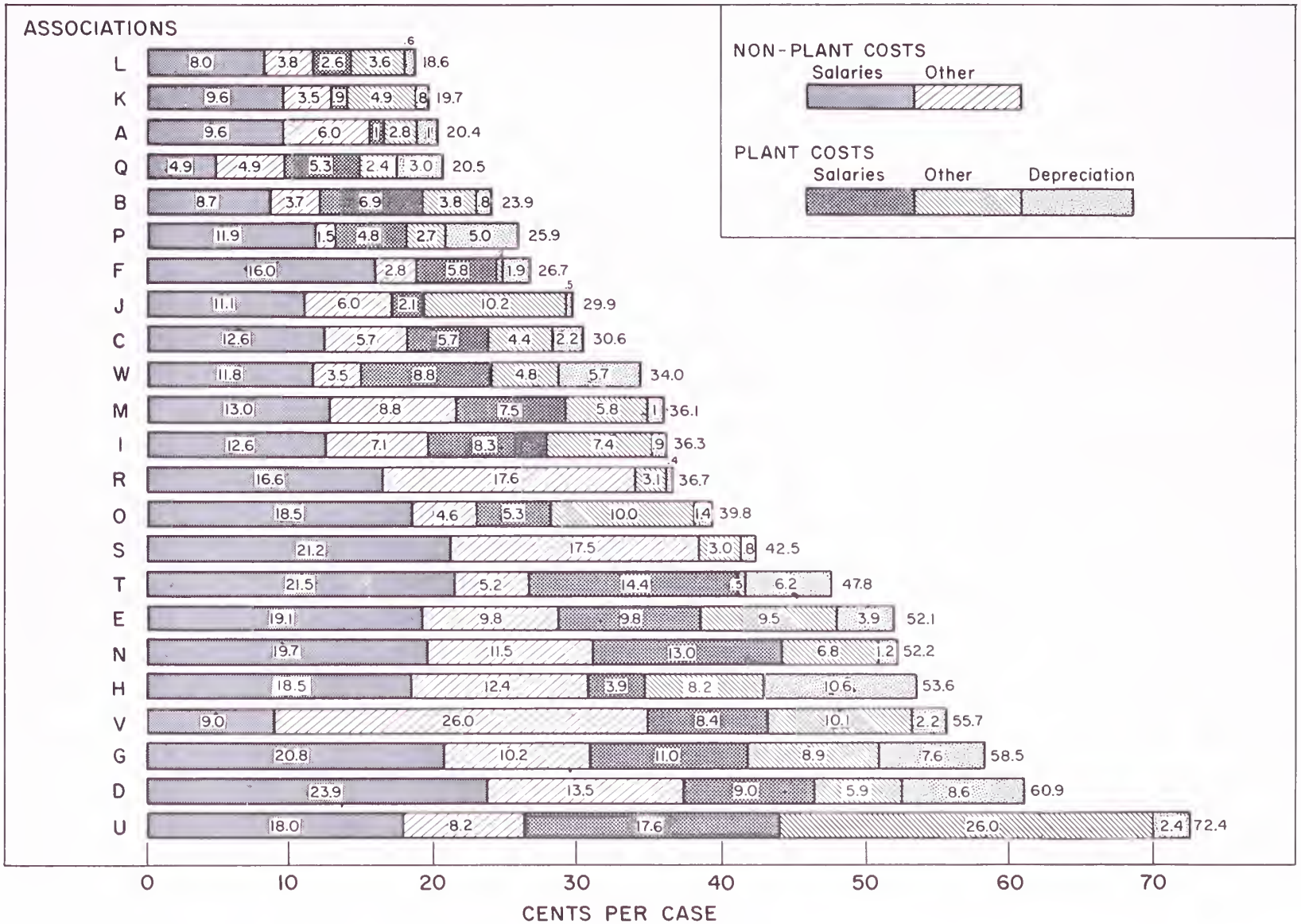
Total indirect costs ranged from a low of 18.6 cents a case for a dairy type association to a high of 72.4 cents a case for an association in the Western area (appendix table 2 and figure 3) and averaged 38.9 cents. Indirect non-plant costs were a larger proportion of total indirect costs than were indirect plant costs. Non-plant costs averaged 23.1 cents a case or 60.3 percent of total indirect costs. Salaries made up the greatest share of total indirect costs--55.7 percent for 23 associations (appendix table 4). The range was from a low of 20.7 percent to a high of 90.2 percent.

It was difficult to accurately determine and measure factors affecting indirect egg handling costs among associations because the services performed by the associations involved were not the same and all were not of the same type. However, a few factors were found which explained some of the indirect cost variations.

Hourly Salary Costs

Hourly indirect salary costs caused variations in total indirect

Figure 3. Indirect costs per case of eggs received, 23 associations, 2-week period.



costs a case; hourly salary costs varied widely among associations and, as previously stated, total salaries averaged nearly 56 percent of total indirect costs for 23 associations. Of these 23 associations, 15 furnished data that made it possible to determine hourly indirect salary costs.[9] Table 40 shows the hourly labor cost for these associations. They ranged from a low of $1.29 an hour for association I in the North Central area to a high of $2.85 for association E in the Northeast. The average for 15 associations was $1.91 an hour compared with $1.63 for 9 North Central associations and $2.33 for 6 Northeast associations.

Figure 4 shows the effect of differences in hourly indirect salary costs on total indirect costs a case.

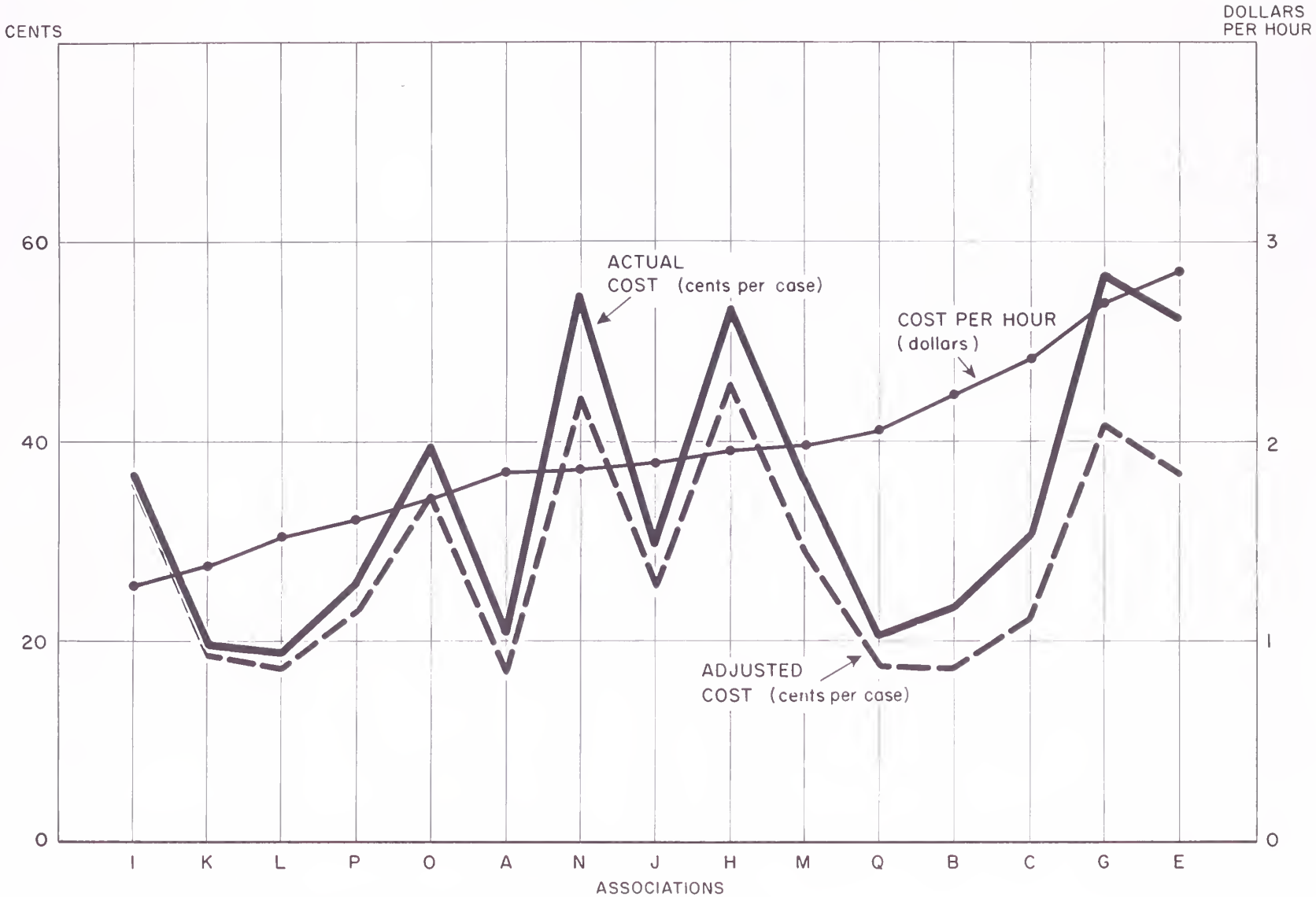
[9] Western associations not included because data to determine hourly salary costs were not available.

TABLE 40.--Indirect costs: Average hourly salary cost, actual and adjusted[1] average salary cost per case, and total indirect costs, 15 associations, 2-week period

Area and association	Hourly salary rate	Cost per case		
		Salaries		Total indirect[2]
		Actual	Adjusted	
		Cents		
Northeast				
A	$1.82	10.6	7.5	17.3
H	1.95	22.4	14.8	46.0
B	2.24	15.6	9.0	17.3
C	2.41	18.3	9.8	22.1
G	2.70	31.8	15.2	41.9
E	2.85	28.9	13.1	36.3
North Central				
I	1.29	20.9	20.9	36.3
K	1.39	10.5	9.7	18.9
L	1.51	10.6	9.1	17.1
P	1.60	16.7	13.5	22.7
O	1.70	23.8	18.1	34.1
N	1.84	32.7	22.9	42.4
J	1.89	13.2	9.0	25.7
M	1.98	20.5	13.4	29.0
Q	2.05	10.2	6.4	16.9
Averages:				
15 associations	1.91	19.1	13.2	28.6
Northeast	2.33	21.3	11.6	30.2
North Central	1.63	17.7	14.3	27.6
Range:				
Low	1.29	10.2	6.4	16.9
High	2.85	32.7	22.9	46.0

[1] Adjusted to lowest average hourly indirect labor cost.
[2] Adjusted salary cost plus indirect costs.

Figure 4. Indirect costs: Average hourly salary cost and total actual and adjusted[1] indirect cost per case of eggs received, 15 associations, 2-week period.



[1] Labor cost adjusted to lowest average hourly indirect labor cost plus other indirect costs.

Total actual indirect costs are shown in relation to the actual total cost after indirect labor costs a case were adjusted for differences in hourly labor costs. For example, the adjusted cost for association G was 16.6 cents a case less than the actual cost. Its hourly labor cost was $2.70 or $1.41 more than that for the association with the lowest hourly labor cost of $1.29. The spread between the actual and adjusted indirect costs widened as the cost of indirect labor an hour increased, particularly beyond $2.40 an hour (figure 4).

Volume Received

No close relationship existed between indirect costs and the volume of eggs received and handled among the associations studied except among those of similar type and services performed.

Table 41 shows the volume of eggs handled and the adjusted indirect costs for six Northeast associations for which hourly indirect labor costs were available. The operations of these associations were more alike than associations in the other two areas. On the average, after adjusting the indirect labor costs for differences in hourly labor rates among associations, the total indirect costs averaged about 41 cents a case when 4,000 cases were handled during a 2-week period. This compared with about 19 cents a case when an average of about 19,000 cases were handled--a decline in indirect costs of 22 cents a case or 1.5 cents for each 1,000 case increase.

TABLE 41.--Indirect costs[1] per case and total number of cases handled, 6 Northeast associations, 2-week period

Association	Cases handled	Cost[1]
Low volume group		*Cents*
H	2,824	46.0
G	4,041	41.9
E	5,137	36.3
High volume group		
C	15,689	22.1
A	20,055	17.3
B	21,834	17.3
Averages:		
6 associations	11,597	30.2
Low volume group	4,001	41.4
High volume group	19,193	18.9
Range:		
Low	2,824	17.3
High	21,834	46.0

[1] Labor cost adjusted to lowest average hourly indirect labor cost.

Type of Association

The 15 associations[10] were grouped into three types: (1) Egg and poultry, (2) dairy, and (3) egg (table 42). The average adjusted cost a case was:

Egg and poultry	23.1 cents
Dairy	26.8 "
Egg	34.1 "

One association classified as egg and poultry also handled feed and other farm supplies, hardware and appliances, and lumber. Three of the egg and poultry associations also handled much larger volumes of eggs than most associations of other types. Three of the dairy type associations employed no plant foreman and one for only part time. One of these associations had the highest adjusted indirect cost of 42.4 cents a case. Of the egg type associations, the one with the lowest cost received the largest volume. These average costs by type of associations indicated that unit indirect costs were somewhat less for associations which have diversified operations than those which handle only eggs.

TABLE 42.--Total indirect costs[1] per case in relation to type of association, 15 associations, 2-week period

Type and association	Indirect cost per case
Eggs and poultry	*Cents*
B	17.3
C	22.1
I	36.3
Q	16.9
Dairy	
J	25.7
K	18.9
L	17.1
N	42.4
O	34.1
P	22.7
Egg	
A	17.3
E	36.3
G	41.9
H	46.0
M	29.0
Averages:	
All associations	28.3
Egg and poultry	23.1
Dairy	26.8
Egg	34.1
Range	
Low	16.9
High	42.4

[1]Salary costs adjusted to lowest average hourly indirect labor cost plust other indirect costs.

Application of Findings

The findings of this report may be applied by an egg handling plant in a number of ways.

1. Comparing their individual costs and labor output with those obtained as a result of this study will give egg handlers a basis for determining whether their costs and labor outputs are out of line. Comparing costs by operations will help spot the area or areas causing the trouble. No plant was found to have consistently low or high costs of labor outputs in all plant operations.

2. The study showed that variations in hourly labor costs among plants was an important cause of variations in unit labor costs, particularly from one regional area to another. When unit labor costs are high because of a high wage scale, a plant may find it necessary to

[10]Salaries for farm supply associations in Western area could not be adjusted.

install laborsaving equipment to help keep such costs in line with unit costs in areas where the wage scale is significantly lower.

3. A second all-important cause of variations in unit labor costs among plants was the variation in labor output a man-hour--a measure of labor efficiency. The labor cost a case for all egg handling operations, after adjusting for effect of hourly labor costs, decreased quite consistently as labor output a man-hour increased. The study showed that a number of things had been done by some of the plants in the study to increase labor efficiency. These can be done by others: (a) Increase volume handled, (b) install laborsaving equipment, (c) make more efficient use of labor, (d) make better plant arrangement, (e) improve egg quality, and (f) integrate or add services.

Volume of Eggs Handled

The direct effect of volume of eggs handled on direct labor costs a case is limited as long as the employees in any given operation are kept fully occupied. However, plants handling a large volume of eggs usually had lower unit costs than those with a small volume. Indirectly a large volume is important in that the use of expensive laborsaving equipment can be feasible and more profitable sales outlets obtained.

Installation of Laborsaving Equipment

As indicated above, labor efficiency may be improved by using laborsaving equipment if the volume justifies and labor cost is high. Example: One association candling and cartoning approximately 4,200 cases a week with new laborsaving equipment, costing 17.4 cents a case, had a labor output of 4.4 cases a man-hour. With labor costing $2.50 an hour, the cost a case was 59 cents. This plus the machine rental of 17.4 cents a case equalled 76.4 cents.

Twelve associations using older equipment candled and cartoned an average of only 2.4 cases a man-hour. If the association using the new equipment had been using the older equipment at the time of the study, had averaged 2.4 cases a man-hour, and had paid $2.50 an hour for labor, the cost a case would have been $1.04 or 28 cents a case more than with the new equipment.

Another association using older type candling and cartoning equipment during the study later installed newer type equipment. The change increased labor output but did not decrease total unit costs for labor and machinery. A comparison before and after the change is shown in the accompanying tabulation.

Item	Hourly labor cost	Cases per man-hour	Cost per case		
			Labor	Equipment	Total
				Cents	
Older type equipment	$1.54	2.8	55.0	3.4	58.4
New type equipment	$1.44	3.4	42.4	16.0	58.4

This association was candling and cartoning 2,822 cases a week with the old equipment and 3,611 cases a week with the new equipment.

These examples indicate that care needs to be exercised when plans for new equipment are being considered. If hourly labor costs are low and new equipment is costly, unit handling costs may be increased rather than decreased by installation of some types of new equipment.

More Efficient Use of Labor

Some associations had high unit labor costs and low labor output because they did not fully utilize time of employees. For example, one association had next to the lowest labor output in the stacking operation yet had a good system for stacking eggs. The cased eggs were pushed on roller conveyors directly from the processing area into the nearby holding room. The employee who worked full time in the holding room was not kept busy because of lack of sufficient volume and infeasibility of assigning him to part-time duties other than helping to load out eggs.

Better Plant Arrangement

At some of the plants, labor outputs were low in some operations because arrangements in the plant were not the best. For example, in some plants, eggs had to be moved some distance from the procurement trucks to the receiving area in the building. At others, eggs had to be moved a distance from the holding room to trucks in the loading out operation. This compared unfavorably with plants that could load directly from the holding room into delivery trucks.

Egg Quality Improvement

Eggs received from producers on quality programs were mass candled rather than candled individually. One association handling eggs both on a quality and non-quality program basis had a labor output of one case a man-hour more for the mass candlers than for the other candlers.

Integrated Services

Associations with such integrated services as marketing poultry and dairy products and handling farm supplies usually can divide certain costs among the various departments and thereby reduce unit handling costs of each department. This particularly applies to administrative costs.

Integrated cooperatives in the study had lower administrative costs a case of eggs than those without integrated services. Also, integration often improves the financial condition of an association and permits greater latitude in paying accounts, borrowing funds during periods of peak financial requirements, and purchasing new equipment when it is advantageous to do so.

Appendix

APPENDIX TABLE 1.--Summary of associations with highest and lowest direct labor cost and primary and contributing factors, by operations

Area	Cost level and association	Operation	Primary factor	Contributing factors
	Highest cost			
Northeast	H	Collecting	Low output	Relatively high hourly labor cost
	G	Receiving	Relatively low output	Relatively high hourly labor cost
	A	Candling and cartoning	High hourly labor cost	Low labor output
	C	Coopering	Relatively low output	Hourly labor cost 72 percent above lowest cost
	G	Stacking	Lowest labor output	Highest hourly labor cost
	D	Loading out	High hourly labor cost	Low labor output
	G	Delivering	Lowest output	High hourly labor cost
	Lowest cost			
	G	Collecting	High labor output	
	E	Receiving	Highest labor output	Nearby receiving room
	E	Candling and cartoning	Relatively high labor output	Relatively low hourly labor cost
	H	Coopering	High labor output	--
	D	Stacking	High labor output	--
	F and H	Loading out	High labor output	F had low hourly labor cost
	F	Delivering	Lowest hourly labor cost	High labor output
	Highest cost			
North Central	O	Collecting	Average labor output	High hourly labor cost
	I	Receiving	Low labor output	Hourly labor cost 33 percent above lowest cost
	I	Candling and cartoning	Low labor output	Hourly labor cost 31 percent above lowest cost
	K	Coopering	Lowest output	Hourly labor cost 44 percent above lowest cost
	N and Q	Stacking	Labor output relatively low	Q had relatively high hourly labor cost
	I	Loading out	Relatively low labor output	Relatively high hourly labor cost
	N	Delivering	Paid commissions	--

APPENDIX TABLE 1.--Summary of associations with highest and lowest direct labor cost and primary and contributing factors, by operations--Cont.

Area	Cost level and association	Operation	Primary factor	Contributing factors
	Lowest cost			
North Central	L	Collecting	Relatively high output	Hourly labor cost near average
	N	Receiving	Relatively high output	Hourly labor cost relatively low
	J	Candling and cartoning	Low hourly labor cost	Medium labor output
	Q	Coopering	Highest labor output	Large volume coopered
	O	Stacking	High labor output	Relatively low hourly labor cost
	L	Loading out	Highest labor output	Low hourly labor rate
	Q	Delivering	Drivers paid by the trip	--
	Highest cost			
Western	W	Collecting	High hourly labor rate	Lowest labor output in area
	R	Receiving	Lowest labor output	High hourly labor cost
	U	Candling and cartoning	High hourly labor cost	Low labor output
	R	Coopering	Low hourly labor output	High hourly labor cost. Small volume
	U	Stacking	High hourly labor cost	Low labor output
	U	Loading out	Highest hourly labor cost	Lowest labor output
	W	Delivering	High hourly labor cost	Relatively low labor output
	Lowest cost			
	V	Collecting	High labor output	Some eggs collected and delivered on same trip
	V	Receiving	Highest labor output	Mechanical unloading equipment
	R	Candling and cartoning	High labor output	Uniformly efficient candlers. High quality eggs
	W	Coopering	High labor output	Large volume
	W	Stacking	Highest labor output	Large volume
	R	Loading out	Highest labor output in area	Eggs moved by stevedore directly from holding room to truck
	V	Delivering	Highest labor output	--

Labor Elements

1. Collecting (hauling to plant):
   Loading truck with empty cases
   Driving truck and driver's helper
   Loading truck at farms
   Making out producers' and route records

2. Receiving (plant labor):
   Unloading (including time of trucker)
   Receiving door deliveries
   Weighing in cases
   Moving eggs to receiving room
   Sorting cases
   Recording receipts

3. Inspecting (wholesale grading):
   Moving eggs to inspectors
   Removing case covers
   Candling desired sample
   Returning eggs to case
   Replacing case covers
   Weighing before or after inspecting
   Removing inspected cases
   Recording and marking inspection results

4. Sizing (by machine when separate from candling):
   Moving eggs to sizer
   Removing case covers
   Placing eggs on machine
   Placing sized eggs in cases
   Replacing case covers
   Removing cases of sized eggs

5. Candling (loose to case):[1]
   Moving eggs to candlers
   Removing case covers
   Obtaining and readying empty cases
   Putting eggs on sizing machine
   Packing loose eggs from sizing machine
   Candling operation
   Putting eggs in cases
   Recording candling results
   Replacing case covers
   Weighing after candling
   Stamping candled case
   Removing cases

6. Cartoning (candling to cartons):[1]
   Moving eggs to candlers
   Removing case covers
   Obtaining and setting up cartons
   Putting eggs on or taking off sizing machine or belt
   Candling operation
   Putting eggs in cartons
   Closing cartons
   Recording candling results
   Marking, sealing, and labeling cartons
   Removing cartoned cases
   Unloading and storing cartons

7. Packing (cartoned eggs):
   Obtaining and readying empty cases
   Stamping, labeling, or marking cartoned cases
   Inserting flats
   Putting cartons in cases
   Closing cases
   Sealing cartoned cases
   Stacking packed cases for removal to holding place

8. Coopering (including storing empty cases):
   Obtaining shook or used cases
   Making or setting up new cases
   Repairing used cases
   Putting flats and fillers in new cases

[1] Per unit labor cost for candling and for cartoning is based upon the actual case output of an operation rather than case input. For example, if 100 cases, of which 15 percent were rejects, went to the cartoning operation, the cost and volumes were allocated based on 85 cases cartoned and 15 cases candled and packed loose.

Putting labels on cases during coopering
Removing coopered cases
Stacking coopered cases

9. Stacking and holding (in plant):
Stacking
Moving cases to holding place
Sorting cases
Restacking cases

10. Loading out:
Moving to trucks or railroad cars
Loading (including time of truckers when helping)
Making out shipping records, bills of lading, and delivery instructions

11. Delivering (hauling to buyers, truck personnel only);
Driving truck
Unloading eggs
Making records of collections

12. Shell treating:
Preparing oil
Readying empty cases and equipment
Moving cases to machine
Oiling
Packing in cases
Labeling, marking, and the like
Removing filled cases

13. Shell cleaning:
Hauling to cleaner
Buffing
Washing
Removing from cleaning operation

14. Egg breaking:
Moving to breaking room
Breaking
Operating mixer, pump, and the like
Filling and covering cans
Putting cans in refrigerator
Making out breaking records
Cleaning equipment and room

Indirect Labor Costs

Indirect labor costs were made up of salaries, including fringe benefits, of managers, office help, salesmen, fieldmen, janitors, night watchmen, repair and maintenance employees, plant foremen, and egg inspectors

Indirect Costs Other Than Labor

Plant:
heat
Light, power, and water
General insurance
Real estate and personal property taxes
Maintenance and repair
Plant supplies (general)
Rent
Depreciation:
Buildings
Plant equipment
Miscellaneous

Non-plant:
Office supplies, stationery, and printing
Postage
Telephone and telegraph
Advertising
Bad debts
Interest
Bank service
Auditing and legal
Travel
Automobile
Directors' expense
Annual meeting expense
Educational expense
Dues and subscriptions
Contributions and donations
Depreciation:
Furniture and fixtures
Automobile
Miscellaneous

APPENDIX TABLE 2.--Summary of associations with highest and lowest direct labor output per man-hour and primary and contributing factors by operations

Area	Output level and association	Operation	Primary factor	Contributing factors
	Highest output			
Northeast	D and G	Collecting	High collections per mile traveled	Cases per stop high
	E	Receiving	Moved from truck to receiving room on skids	Low percentage delivered by producer
	H	Candling and cartoning	Newer type of grading equipment	Egg type association. Producer identity lost on 80 percent of eggs
	D	Coopering	Large volume	Farm cases reused
	D	Stacking	Skid loads of eggs moved to nearby holding room with power lift truck	--
	H	Loading out	Eggs loaded into truck from holding room on roller conveyor	Stacked eggs convenient to conveyor
	F	Delivering	Eggs delivered to warehouse	Relatively short haul
	Lowest output			
	F	Collecting	Low collections per mile traveled	Cases per stop low
	F	Receiving	61 percent door deliveries	--
	F	Candling and cartoning	Hand operation	--
	B	Coopering	Only 58 percent of cases returned to farms	--
	G	Stacking	Time of man in holding room not fully utilized	--
	D	Loading out	No discernible cause	--
	G	Delivering	Numerous stops made	--

APPENDIX TABLE 2.--Summary of associations with highest and lowest direct labor output per man-hour and primary and contributing factors by operations--Cont.

Area	Output level and association	Operation	Primary factor	Contributing factors
	Highest output			
North Central	L	Collecting	Cases per stop relatively high	--
	N	Receiving	Unloaded through port into receiving room	Low percentage delivered by producers
	Q	Candling and cartoning	Electro-mechanical grading equipment	Large volume
	Q	Coopering	Large volume	Collapsible farm cases reused
	O	Stacking	Eggs pushed into holding room on roller track conveyor	Long conveyor required only occasional unloading to stacks
	L	Loading out	Conveyor direct from holding room to truck	--
	Lowest output			
	J	Collecting	Low collections per mile	Cases per stop low
	I	Receiving	From truck to two-wheel hand trucks, then to receiving room	--
	L	Candling and cartoning	Hand operation	Dairy type association
	K	Coopering	Small volume	Cases not returned to farms
	N	Stacking	Comparatively small volume	Time of stacker not fully utilized
	M	Loading out	Time of loader not fully utilized	--

APPENDIX TABLE 2.--Summary of associations with highest and lowest direct labor output per man-hour and primary and contributing factors by operations--Cont.

Area	Output level and association	Operation	Primary factor	Contributing factors
	Highest output			
Western	V	Collecting	Highest collections per mile traveled	Some eggs collected and delivered on same trip
	V	Receiving	Mechanical equipment used to unload eggs	Large volume
	R and V	Candling and cartoning	V had electro-mechanical grading equipment and large volume	--
	W	Coopering	Reused collapsible field cases	--
	W	Stacking	From grading to holding room on skids	Holding room close to processing area
	R	Loading out	Stevedore used to convey eggs directly into truck	--
	V	Delivering	Large volume	Some eggs delivered and collected on same trip
	Lowest output			
	W	Collecting	Low collections per mile	--
	U	Receiving	Receiving room in basement	--
	U	Candling and cartoning	Older type equipment	--
	S	Coopering	Small volume	All reused cases
	U	Stacking	Holding room upstairs	--
	U	Loading out	Eggs to truck on skids	Holding room not convenient to loading dock
	U	Delivering	Comparatively small volume	--

APPENDIX TABLE 3.--Indirect costs: Plant, non-plant, and total indirect costs of eggs received,[1] 23 associations, 2-week period, 1957-58

Area and association	Indirect plant costs				Indirect non-plant costs				Total indirect costs	Average volume received
	Salaries[2]	Other[3]	Depreciation[4]	Total	Salaries[5]	Other[6]	Depreciation[7]	Total		
	Cents per case									*Cases*
Northeast:[8]										
B	6.9	3.8	0.8	11.5	8.7	3.6	0.1	12.4	23.9	--
A	1.0	2.8	1.0	4.8	9.6	5.9	.1	15.6	20.4	--
C	5.7	4.4	2.2	12.3	12.6	5.3	.4	18.3	30.6	--
D	9.0	5.9	8.6	23.5	23.9	13.1	.4	37.4	60.9	--
E	9.8	9.5	3.9	23.2	19.1	9.4	.4	28.9	52.1	--
F	5.8	.2	1.9	7.9	16.0	2.7	.1	18.8	26.7	--
G	11.0	8.9	7.6	27.5	20.8	10.1	.1	31.0	58.5	--
H	3.9	8.2	10.6	22.7	18.5	11.6	.8	30.9	53.6	--
North Central:[8]										
Q	5.3	3.0	2.4	10.7	4.9	4.7	.2	9.8	20.5	--
P	4.8	2.7	5.0	12.5	11.9	1.5	([9])	13.4	25.9	--
M	7.5	5.8	1.0	14.3	13.0	7.7	1.1	21.8	36.1	--
L	2.6	3.6	.6	6.8	8.0	3.7	.1	11.8	18.6	--
O	5.3	10.0	1.4	16.7	18.5	4.1	.5	23.1	39.8	--
I	8.3	7.4	.9	16.6	12.6	7.0	.1	19.7	36.3	--
N	13.0	6.8	1.2	21.0	19.7	10.1	1.4	31.2	52.2	--
K	.9	4.9	.8	6.6	9.6	3.4	.1	13.1	19.7	--
J	2.1	10.2	.5	12.8	11.1	5.8	.2	17.1	29.9	--
Western:[8]										
V	8.4	10.1	2.2	20.7	9.0	25.4	.6	35.0	55.7	--
T	14.4	.5	6.2	21.1	21.5	5.2	([9])	26.7	47.8	--
W	8.8	4.8	5.7	19.3	11.8	3.3	.2	15.3	34.6	--
U	17.6	26.0	2.4	46.0	18.2	6.0	2.2	26.4	72.4	--
R	--	2.1	.4	2.5	16.6	17.6	([9])	34.2	36.7	--
S	--	3.0	.8	3.8	21.2	17.5	([9])	38.7	42.5	--
Averages:[10]										
All associations	6.7	6.3	2.9	15.8	14.6	8.0	.5	23.1	38.9	6,702
Northeast	6.6	5.4	4.6	16.6	16.2	7.7	.3	24.2	40.8	9,759
North Central	5.5	6.1	1.5	13.1	12.1	5.4	.4	17.9	31.0	3,804
Western	8.4	7.7	3.0	18.9	16.4	12.5	.5	29.4	48.3	6,975
Range:										
Low	.9	.2	.4	2.5	4.9	1.5	.1	9.8	18.6	--
High	17.6	26.0	10.6	46.0	23.9	25.4	2.2	38.7	72.4	--

[1] Receipts for 12 months ending with period of study.

[2] Includes association wages or salaries for plant supervision, janitor and watchman, and maintenance and repair labor.

[3] Includes expenses for heat, utilities, general insurance, taxes (real estate and personal property), maintenance and repair, plant supplies, and miscellaneous.

[4] Includes depreciation of buildings and plant machinery and equipment.

[5] Includes salaries of manager, clerical help, fieldmen, and salesmen.

[6] Includes such non-plant expenses as telephone and telegraph, advertising, auditing, directors' expense, annual meetings and the like, except depreciation.

[7] Includes depreciation on office furniture and fixtures.

[8] Arranged in order of volume received--from highest to lowest.

[9] Not obtained separately.

[10] Unweighted.

APPENDIX TABLE 4.--Indirect costs: Percentage distribution of plant and non-plant costs, 23 associations, 2-week period, 1957-58

Area and association	Indirect plant costs				Indirect non-plant costs				Total indirect costs
	Salaries[1]	Other[2]	Depreciation[3]	Total	Salaries[4]	Other[5]	Depreciation[6]	Total	
					Percent				
Northeast:									
A	4.9	13.8	4.8	23.5	46.9	29.0	0.6	76.5	100
B	28.9	15.9	3.3	48.1	36.4	15.1	.4	51.9	100
C	18.6	14.4	7.2	40.2	41.2	17.3	1.3	59.8	100
D	14.8	9.7	14.1	38.6	39.2	21.5	.7	61.4	100
E	18.9	18.2	7.4	44.5	36.7	18.1	.7	55.5	100
F	21.7	.8	7.1	29.6	59.9	10.1	.4	70.4	100
G	18.8	15.2	13.0	47.0	35.6	17.2	.2	53.0	100
H	7.3	15.3	19.8	42.4	34.5	21.6	1.5	57.6	100
North Central:									
Q	26.2	14.5	11.7	52.4	23.6	22.9	1.1	47.6	100
P	18.4	10.5	19.4	48.3	45.9	5.8	(7)	51.7	100
M	20.8	16.1	2.7	39.6	35.9	21.3	3.2	60.4	100
L	13.8	19.3	3.5	36.6	43.4	19.7	.3	63.4	100
O	13.4	25.2	3.4	42.0	46.4	10.3	1.3	58.0	100
I	23.0	20.2	2.6	45.8	34.7	19.2	.3	54.2	100
N	24.9	13.0	2.3	40.2	37.7	19.4	2.7	59.8	100
K	4.6	24.7	4.3	33.6	48.8	17.2	.4	66.4	100
J	6.9	34.1	1.9	42.9	37.1	19.5	.5	57.1	100
Western:									
V	15.1	18.1	4.0	37.2	16.1	45.6	1.1	62.8	100
T	30.3	1.0	12.9	44.2	45.0	10.8	(1)	55.8	100
W	25.5	13.8	16.6	55.9	34.2	9.5	.4	44.1	100
U	24.4	35.8	3.4	63.6	25.1	8.3	3.0	36.4	100
R	--	5.7	1.1	6.8	45.4	47.8	(7)	93.2	100
S	--	7.1	1.9	9.0	49.8	41.2	(7)	91.0	100
Averages:[8]									
All associations	16.6	15.8	7.3	39.7	39.1	20.4	.8	60.3	100
Northeast	16.7	12.9	9.6	39.2	41.3	18.7	.8	60.8	100
North Central	16.9	19.7	5.8	42.4	39.3	17.2	1.1	57.6	100
Western	15.9	13.6	6.7	36.2	35.9	27.2	.7	63.8	100
Range:									
Low	4.6	.8	1.1	6.8	16.1	5.8	.2	36.4	-
High	30.3	35.8	19.8	63.6	59.9	47.8	3.2	93.2	-

[1] Includes association wages or salaries for plant supervision, janitor and watchmen, and maintenance and repair labor.

[2] Includes expenses for heat, utilities, general insurance, taxes (real estate and personal property), maintenance and repair, plant supplies and miscellaneous. Depreciation not included.

[3] Includes depreciation of buildings and plant machinery and equipment.

[4] Includes salaries of manager, clerical help, fieldmen, and salesmen.

[5] Includes such non-plant expenses as telephone and telegraph, advertising, auditing, directors' expense, annual meetings, and the like, except depreciation.

[6] Includes depreciation on office furniture and fixtures.

[7] Not obtained separately.

[8] Unweighted.

☆ U S GOVERNMENT PRINTING OFFICE · 1962 O - 644907

Other Publications Available

The Story of Farmers' Cooperatives, Educational Circular 1.

Organizing a Farmer Cooperative, FCS Circular 18.

Cost of Handling Eggs and Labor Output of Selected Cooperatives - Combined Report of Northeast, North Central and Western Areas. General Report 88. Harry E. Ratcliffe.

Cost of Marketing Eggs and Labor Output of Selected Cooperatives, Part I, Northeast, General Report 59. Harry E. Ratcliffe.

Cost of Marketing Eggs and Labor Output of Selected Cooperatives, Part II, North Central, General Report 72. Harry E. Ratcliffe.

Cost of Handling Eggs and Labor Output of Selected Cooperatives, Part III, Western, General Report 75. Harry E. Ratcliffe.

Cooperative Marketing of Eggs and Poultry in Ohio, Bulletin 59. Harry E. Ratcliffe.

Poultry and Egg Cooperatives Vary Widely, Bulletin Reprint 1. John J. Scanlan.

Cooperative Marketing of Turkeys, FCS Circular 23. Henry W. Bradford and John J. Scanlan.

Using Your Poultry and Egg Cooperative, Educational Circular 9. John J. Scanlan.

A copy of each of these publications may be obtained upon request while a supply is available from--

Growth Through Agricultural Progress

Information Division

FARMER COOPERATIVE SERVICE
U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D. C.